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THE AMERICAN GAS LIGHT JOURNAL

REDMAN & KENNY, N.Y.

PUBLISHING OFFICE No. 32 PINE STREET

DEVOTED TO THE INTERESTS OF ILLUMINATION, HEATING, MECHANICAL, CHEMICAL AND GENERAL SCIENCE.

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The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

CONTENTS.

An Asterisk (*) denotes an illustrated article.

OFFICIAL NOTICES—
Cost of Proceedings, Western Gas Association, to Non-Members. 685
Meeting of the Kansas Gas, Water and Electric Light Association. 685
EDITORIALS—
Briefly Told ... 685
Convoking an International Congress of the Gas Men—The Last Day of the Meeting—Notes.
Twenty-seventh Annual Meeting of the American Gas Light Association—Abstract of Proceedings ... 686
First Day's Session—Application for Membership—Election of New Members—Report of the Council—Reports of Treasurer and Secretary—Report of the Trustees of the Gas Educational Fund—Report of Committee on Research—Report of Committee on Nominations—Election of Officers—Some Communications—A Japanese Ambassador—Inaugural Address—Reading the Papers—Notes on Prepayment Meters, by Mr. A. H. Strecker—*The Pumping of Gas, by Mr. George J. Roberts.
American Competition—No. IV. ... 693
An English View of the Iron Situation ... 694
Special English Correspondence ... 695
New Lamps for Old Ones—Control up to the Burner.
ITEMS OF INTEREST FROM VARIOUS LOCALITIES ... 696
Something from Urbana, Ills.—Contract for the Kerr-Murray Company—Board of Trustees Organized, Wheeling, West Va.—Annual Meeting, Troy, N. Y.—A Conundrum from Little Rock, Ark.—The Lake Shore Gas Engine Company—A Circular to the Shareholders in the Lowell (Mass.) Company—Public Lighting, Belvidere, Ills.—Respecting the New Brunswick, N.J., Company—Death of Mr. Lucien Sharpe—Proposed Opposition for Pottsville, Pa.—Hints from Augusta, Ga.—Contract for the Berlin Iron Bridge Company—New Gas Rate, Hamilton, Can.—And Many Other Items.
Electrolysis ... 697
Rolling Large Seamless Pipe ... 698
The Market for Gas Securities ... 698

[OFFICIAL NOTICE.]

Cost of Proceedings, Western Gas Association, to Non-Members.

WESTERN GAS ASSOCIATION, OFFICE OF THE SECRETARY,
NEW ALBANY, IND., Sept. 29, 1899.

Bound copies containing the Proceedings of the Western Gas Association for the years 1896-97-98 can be obtained for the sum of $2 each. Make your remittances payable to the Secretary.

JAMES W. DUNBAR, Secy.

[OFFICIAL NOTICE.]

Meeting of the Kansas Gas, Water and Electric Light Association.

OFFICE OF THE SECRETARY AND TREASURER,
LEAVENWORTH, KAS., Oct. 19, 1899.

Gentlemen: The Fall meeting of the Kansas Gas, Water and Electric Light Association will be held in Kansas City, Kas., Wednesday and Thursday, November 15th and 16th next. On behalf of the Association I cordially invite you to be present, believing that such presence will prove advantageous to you and to the Company you represent. Practical papers, relating to gas, water and electric light, will be discussed at the meeting.

Headquarters and place of meeting will be decided upon in the next few days, and the selections will, in prompt, due time, be communicated to the members.

J. H. FOLEY, Secretary.

BRIEFLY TOLD.

CONVOKING AN INTERNATIONAL CONGRESS OF THE GAS MEN.—At the last meeting of the American Gas Light Association, and embodied in the report of its Council, short mention and brief notice were made of an invitation that looked to merit more speech and further consideration than it received. The invitation was from the President of the French Society of Gas Engineers, who, through the President of the American Gas Light Association, asked that the latter inform his confreres that, at the Paris Exposition Universelle, to be held next year, it was proposed to hold an international convention of gas men. The complete action of the Association in respect of the invitation will be found in our current report of the proceedings in this number. Supplementing all that, we may say on our own account that M. Th. Vautier, the President of the French Society of Gas Engineers, forwarded us the following letter:

SOCIETE TECHNIQUE DE L'INDUSTRIE DU GAZ EN FRANCE,
65 RU DE PROVENCE, PARIS, OCTOBER 9, 1899.

To the Directors of the AMERICAN GAS LIGHT JOURNAL: I have the honor to address to you this communication, in the matter of a proposed international congress of the gas industry. The Societe Technique de l'Industrie du Gaz en France has taken the initiative to bring about, on the occasion of the Universal Exposition for 1900, a reunion, in international Congress assembled, of all the Societies like ours, and of all the persons who are interested in the progress of the gas industry. This Congress is to be held in Paris in the first week of September, 1900. It is fervently hoped that the representatives of the gas industry will understand that the motive for this call for an International Congress is essentially in the wish that it may bind together in closer amity and fraternal reunion the members who labor in our grand industry. To this end the Societie Technique asks that your Gas Associations of the United States, and that the voice of your JOURNAL as well, assist in causing this Congress to assume a truly international aspect. This communication is addressed to you in a general as well as in an individual way, to the end that all may be induced to help us in

our effort to promote fraternality. In due time I shall be pleased to forward you statements respecting the progress that is being made as to the details of the many arrangements which shall have to be made. Meanwhile, gentlemen, let me ask you to accept the assurance of my very distinguished consideration. TH. VAUTIER,
the President.

To us this looks like a closer coming together of the gas men of the world (that is, of the gas engineers of the world) than could possibly have been dreamt in the days of the Paris Exhibition of 1878. Then the Frenchmen were a trifle doubtful even of Great Britain's gas men; in 1889 the mistrust of other than French engineers had yielded to the point that one or two clever German gas men were received with open arms in the gas pavilion of the Exhibition of that year; and now comes Jean Crapaud with an invitation to the gas men of the world! So the world moves; coming closer and closer as its inhabitants in civilization understand better the true meaning of the great trinity of expression coined by an immortal Frenchman—liberty, fraternity, equality. The true significance of the invitation extended to American gas men by President Vautier in the name of his colleagues will be the better appreciated as time goes on, and it behooves us to see to it that an earnest practical response to it is made. In fact, to begin with, the American Association might possibly have done well had it delegated its President for the Exposition year to represent it officially in the World's Congress of gas men. Indeed, it is not too late to make that deputization yet; for the Council has the power to do that which was left undone.

THE LAST DAY OF THE MEETING.—The outing time of the American Gas Light Association, which had for its main feature an excursion in, on and over the waters of New York harbor and bay, during the hours of Friday, the 20th inst., was completed in somewhat different manner from that declared by us last week. We said then that the start would be made at 9 A.M. from the foot of West 34th street, and that the Laura M. Starin would carry the party to witness what proved the final quietus to Sir Thomas Lipton's effort to lift the cup. The start was made from the pier or point named, but the time was 9 45, and the boat was the Sam Sloan. However, as the man for whom the boat is named is a pretty good gas man, no fault could be found with the substitution. The air was cool, the winds were high, the sky was blue, and Sandy Hook could tell a tale, were it not for the fact that Sandy Hook does'nt think much about such things, seeing that they are of common occurrence. In other words, *mal de mer* got in its work, "in many instances." Much of the race was not seen, nor was much of anything eaten, although many would have liked a snack when, on the return, the waters of the inner bay managed to convince the Sam Sloan that her keel wasn't so old after all. However, no lives were lost; although some severe suffering was reported. A fellow voyager, in recounting some of the incidents of the trip, has this to say: "A sail of the sort to which we were treated could hardly be expected to have the variety or excitement of a day at a horse race or around a bull ring, but in considering its success one may use the rather negative judgment that nothing happened to mar the pleasure of those who were up to participating in the excursion. A gas man, from the nature of his work, can have no office hours, but must carry the responsibility of his benches, generators, holders, etc., day and night, week in and week out, as long as he is in his town, or in reach of the same by telephone or telegraph. It follows, then, that a day of relaxation, away from the cares of business, where he is without worry, and when he must leave the responsibility with his foreman and assistants, is something to be desired. From this point of view the trip was an unqualified success. Through a matter of chance the best day of the series for the international cup yacht contest came our way, thus affording an excuse to drive the Sloan out upon the ocean; although from the distance the yachts were away from the steamer, there was very little to be seen of the race—just two sails on the horizon; but as the "sailors" could purchase the newspapers on their return, and thus find out what they had been seeing, no great damage was done. Incidentally, we were favored with a clear, bracing day, and the sea was so smooth that very few suffered inconvenience from seasickness. The Committee left nothing to be desired in the way of music and refreshments, and, on the whole, the affair made an agreeable termination to the New York meeting." These are the two sides to the sail.

NOTES.—The Kings County Gas and Illuminating Company has authorized the firm of Bartlett, Hayward & Company to construct for it a complete, new, modern gas plant. The plant is to be constructed on the Company's ground, on First avenue, between 54th and 55th streets, Brooklyn, N. Y., and the feature of the generating apparatus is that it is to consist of 5 benches of 9's on the inclined plan. The designs are by Mr. Fred. Mayer. We understand that in due time the Company's plant will be further enlarged, the initial scheme showing that this construction is but a fourth of the planned total.——The Detroit Gas Company has declared a dividend of 2½ per cent.

[ABSTRACT OF PROCEEDINGS.]

TWENTY-SEVENTH ANNUAL MEETING OF THE AMERICAN GAS LIGHT ASSOCIATION.

HELD IN SHERRY'S HALL, NEW YORK CITY, OCT. 18 AND 19, 1899.

FIRST DAY'S SESSION, WEDNESDAY, OCT. 18.

The Association was called to order, at 10 o'clock A.M., by the President, Mr. A. C. Humphreys, of New York. The Secretary (Mr. A. E. Forstall, Montclair, N. J.), occupied the recorder's chair. On motion the minutes of the last meeting were not read.

APPLICATIONS FOR MEMBERSHIP.

The President called for the report of the Council, in so far as the latter was concerned with the applications for membership. The report was read by Secretary Forstall, as follows:

NEW YORK, Oct. 18, 1899.

To the American Gas Light Association—Gentlemen: Your Council has approved the following applications for membership, and submits them to you with a recommendation that they receive favorable action:

Active.

Anderson, W. C., Red Bank, N. J.; Superintendent Consolidated Gas Company of New Jersey.

Arthur, F. M., 1706 North Broad street, Philadelphia, Pa.; Superintendent Spring Garden District, Philadelphia Gas Works, United Gas Improvement Company.

Benner, H. W., Bethlehem, Pa.; Superintendent Wyandotte Gas Company.

Brundrett, E L., Broad and Arch streets, Philadelphia, Pa.; Commercial Agent United Gas Improvement Company.

Buck, D., Phœnixville, Pa; Superintendent Consolidated Schuylkill Gas Company.

Callanan, J. M., Chester, Pa.; Superintendent Delaware County Gas Company.

Cooke, A. S., 109 Main street, Lockport, N. Y.; Treasurer Lockport Gas and Electric Light Company.

Cooper, W. H., Amsterdam, N. Y.; Superintendent Chuctanunda Gas Light Company.

Earnshaw, E. H., 22d and Filbert streets, Philadelphia, Pa.; Assistant to Engineer of Works, Philadelphia; the United Gas Improvement Company.

Eaton, W. M., Jackson, Mich.; General Manager Jackson Gas Company.

Elles, E. J., Macon, Ga.; Superintendent Macon Gas Light and Water Company.

George, T. L., N.W. cor. Broad and Arch streets, Philadelphia, Pa.; General Agent, Philadelphia, the United Gas Improvement Company.

Golden, J. W., Savannah, Ga.; Secretary Mutual Gas Light Company.

Graham, M. M., 340 Third avenue, New York city; Secretary and Treasurer New Amsterdam Gas Company.

Haines, J., Broad and Arch streets, Philadelphia, Pa; Consulting Engineer with the United Gas Improvement Company.

Hamilton, D., 1006 East 176th street, New York city; Secretary and Treasurer Northern Union Gas Company.

Hartpence, C. C., Ravenswood, Long Island City, N. Y.; Superintendent Ravenswood Works, New Amsterdam Gas Company.

Holmes, R. E., Winsted, Conn., Station A; President Winsted Gas Company.

Horton, T. O., 112 N. Broad street, Philadelphia, Pa.; President New Jersey Suburban Gas Company, of Camden, N. J.

Howes, R. V., Yonkers, N. Y.; Assistant Superintendent United Gas Improvement Company, for the Yonkers Gas Companies.

Huntington, F., 340 Third avenue, New York city; Secretary and Treasurer New Amsterdam Gas Company.

Klumpp, J. B., Broad and Arch streets, Philadelphia, Pa.; Consulting Gas Engineer with the United Gas Improvement Company.

Konrad, A., 40 N. Washington street, Tarrytown, N. Y.; Secretary and Director Hudson River Gas and Electric Company.

Lathrop, A. P., N.W. cor. Front and Long streets, Columbus, Ohio; Secretary and Treasurer Columbus Gas Company.

Leonard, C. F., 64 Centersquare, Easton, Pa.; Superintendent Easton Gas Company.

Manier, R. W., 30 Chenango street, Binghamton, N. Y.; Treasurer Binghamton Gas Works.

Miller, C., 446 Market street, Newark, N. J.; Engineer in charge, Market Street Works, Essex and Hudson Gas Company.

Molony, M., 37th and Market streets, Philadelphia, Pa.; Superintendent West Philadelphia District, United Gas Improvement Company.

Morris, W. C., Ravenswood, Long Island City, N. Y.; Assistant Superintendent, Ravenswood Works, New Amsterdam Gas Company.

Norcross, J. D., Spartanburg, S. C.; Superintendent Spartanburg Railway, Gas and Electric Company.

Nutting, C. H., Chicopee, Mass.; Superintendent of Chicopee Gas Light Company.

O'Shea, T. E, 96 Broadway, New York city; Vice-President Herkimer County Light and Power Company.

Paullins, W. C., Colorado Springs, Col.; Superintendent of Colorado Springs Light and Power Company.

Pelton, F. K, Detroit, Mich.; Secretary and Treasurer Bowling Green Gas Company.

Planck, J. W., Glens Falls, N. Y.; Superintendent of Works, Glens Falls Gas and Electric Light Company.

Pond, E. C., Elmira, N. Y.; Superintendent Elmira Gas and Illuminating Company.

Riege, R., 26 Front street, Newark N. J.; Superintendent Front street works, Essex and Hudson Gas Company.

Riselay, W. S., 188 Main street, Buffalo, N. Y.; Secretary of Buffalo Gas Companies.

Rosenquest, E., Westchester, New York city; Vice-President and General Manager, Bronx Gas and Electric Company.

Sabbaton, F. A., Glens Falls, N. Y.; Secretary Glens Falls Gas and Electric Light Company.

Sloper, A. J., 19 W. Main street, New Britain, Conn; Treasurer New Britain Gas Light Company.

Spinning, W. V., Peru, Indiana; Superintendent Peru American Gas Company.

Stilwell, B. W., Yonkers, N. Y; Agent United Gas Improvement Company, the Yonkers Gas Companies.

Terry, F. L., New London, Conn.; Secretary and General Manager, New London Gas and Electric Company.

Thomas, W. C., 185 Main street, Hackensack, N. J.; Treasurer Gas and Electric Company, of Bergen County, N. J.

Tuttle, W. B., Long Branch, N. J.; Superintendent Consolidated Gas Company of New Jersey.

Walker, E. M., 53 Fairmount avenue, Hyde Park, Mass.; Secretary and Assistant Treasurer, Dedham and Hyde Park Gas and Electric Light Company.

Warner, G. H., 1131 Broadway, New York, N. Y.; Vice-President Peekskill (N. Y.) Gas Light Company.

Whitcomb, H. D., Jr., 7 and 9 Congress street, West, Savannah, Ga.; Superintendent Mutual Gas Light Company.

White, C. E., 210 Main street, Wakefield, Mass.; Manager Wakefield Municipal Gas Light Company.

Wilson, H. B., 40 Wall street, New York, N. Y.; President Lockport Gas and Electric Company.

Young, P. S., 109 and 111 Montgomery street, Jersey City, N. J.; Assistant Agent United Gas Improvement Company, Jersey City, N. J.

Associate.

Adams, T., Jr., 102 Flatbush avenue, Brooklyn, N. Y.; Manufacturer of Self Gas Lighters.

Barbour, W. T., Detroit, Mich.; President Detroit Stove Works.

Boal, S., Piqua, O.; Vice President Favorite Stove and Range Company, Manufacturer of Gas Ranges.

Cartwright, H. R., N. W. cor. 22d and Arch streets, Philadelphia, Pa.; Manager American Meter Company, Philadelphia factory.

Fisk, J. T., Concord, N. H.; Gas Stove Salesman with Schneider & Trenkamp Co., Cleveland, Ohio.

Gribbel, W. S., 52 Dey street, New York City; Agent John J. Griffin & Company.

Guenther, C. M., 12th and Brown streets, Philadelphia, Pa.; Manager of Harris Bros. & Company.

Humphreys, H., M. E., 31 Nassau street, New York City; Assistant Engineer Humphreys & Glasgow.

Luqueer, R. O., M. E., 31 Nassau street, New York City; Assistant Engineer Humphreys & Glasgow.

McIntyre, J. K., 116 North Main street, Dayton, Ohio; Director Dayton Gas Light and Coke Company.

Norton, A. E., 8 Medford street, Boston, Mass.; representing Nathaniel Tufts Meter Company.

Sadtler, J. P. B., 813 South Howard street, Baltimore, Md.; of J. P. B. Sadtler & Co.

Silliman, A. D., Broad and Arch streets, Philadelphia, Pa.; Cadet Engineer United Gas Improvement Company.

Steward, R. B., 107 Chambers street, New York city; Eastern Agent D. M. Steward Manufacturing Company.

Taylor, H. G., M. E., 9 Victoria street, London, S. W., England; Assistant Engineer Humphreys & Glasgow.

Wood, S., 400 Chestnut St., Philadelphia, Pa.; of R. D. Wood & Co.

Transfer.

Battin, W. I., Sheboygan, Wis.; Superintendent Sheboygan National Gas Company.

Starr, G. W., General Manager Wallingford (Conn) Gas Light Company; P. O. Box, 657.

Number of applications: Active, 52; associate, 16; total, 68; transfers, 2. Respectfully submitted for the Council,

ALFRED E. FORSTALL, Secy. ALEX. C. HUMPHREYS, Pres.

ELECTION OF NEW MEMBERS.

On motion of Capt. White the Secretary was instructed to cast a ballot for the election of the gentlemen recommended. The tellers (Capt. White and Mr. Ramsdell) subsequently reported that the Secretary had carried out his instructions. The President then introduced the new members to their associates, and hoped that the former would have no hesitancy in taking active part in the proceedings.

The President here called for the general

REPORT OF THE COUNCIL,

which the Secretary read.

NEW YORK, OCTOBER 18, 1899.

To the American Gas Light Association—Gentlemen: Your Council has the honor to make its annual report as follows:

A separate report upon applications for membership recommends the election of 68 members.

The resignations of six active and two associate members have been received and accepted.

The following list of papers has been approved to be read at this meeting:

"Another View of Interior Illumination," by F. N. Morton, Hoboken, N. J.

"The Steam Consumption in a Water Gas Plant," by Alten S. Miller, New York, N. Y.

"The Pumping of Gas," by George J. Roberts, Philadelphia, Pa.

"Carburetted Water Gas as a Coal Gas Auxiliary," by A. G. Glasgow, London, England.

"Some Experiments with the Edgerton Standard," by Rollin Norris, Philadelphia, Pa.

"Notes on Prepayment Meters," by Alex. H. Strecker, Newark, N. J.

Your Council reports that Dr. Henry Morton, President of the Stevens Institute of Technology, has, at the solicitation of the Council, consented to deliver a lecture to the Association at this meeting on "Recent Developments in Artificial Illumination."

The Council has appointed two additional members of the Research Committee—A. E. Forstall and Rollin Norris.

The Association has received the following communication from the Societe Technique de l'Industrie du Gaz en France:

"The Council of the Societe Technique de l'Industrie du Gaz en France has taken the initiative in proposing a reunion in an International Congress, on the occasion of the Universal Exposition of 1900, of all the Societies similar to itself, and of all persons who are interested in the progress of the gas industry.

"This Congress will be held in Paris in 1900, and very probably on the 3d or 4th of September, at the Exposition in the Hall of Congresses.

"It has seemed to us that a reunion of this nature could give useful results in bringing about an exchange of views upon the most important points of the manufacture and utilization of gas as well as upon questions which are attached to these subjects.

"It seemed to us all the more opportune, because there has never been, up to the present, a universal Congress devoted to the gas industry, and it is to be hoped that this first reunion will evoke a great interest.

"It will form, moreover, bonds of friendship and fraternity between all the representatives of our industry, which cannot help but be profitable to this industry itself.

"It is in this spirit that we come to invite your honorable Society to take part in this Congress.

"We have thought that it was not necessary to fix as yet in a definite manner the programme of the works (or transactions) of the Congress, but from now on we will busy ourselves in examining a certain number

of questions which could be usefully treated, and we will be very much obliged to you if you would make known to us those which you judge could appropriately be placed on the programme.

"We will receive with gratitude all the observations and propositions which you will be kind enough to address to us.

"The Committe of Organization will afterwards fix and send to you the definite programme of transactions, which will comprise, besides technical questions, visits to the Exposition and to various works, a banquet offered by the Societe Technique du Gaz to all the members of the other societies, etc.

"If, therefore, as we earnestly hope will be the case, you will kindly reply to our appeal we will be very grateful if you will send in three copies, and with the least possible delay, the list of your active members (Societaire is the designation of the class of members in the French Society that corresponds to our class of active members, but it may possibly be used in this connection to denote all the members of the Association) which we will communicate to the General Secretary's department of the Exposition, and either by his care or by our own you will receive in ample time the programme of the Congress, as well as the steps to be taken in order to join it.

"Will you be pleased to accept, Mr. President, the assurance of my distinguished consideration."

Your Council recommends that all the members of this Association who may visit Paris at the time of the Exposition of 1900 be accredited as delegates from this Association to the Societe Technique de l'Industrie du Gaz en France, and requested to attend and take part in the meetings of that Society; that the officers of the Association, and the Research Committee, be requested, as far as practicable, to comply with the requests of that Society in the recommendation of subjects for discussion; and that the members of the Association be individually requested to send to the Secretary, prior to December 1st, 1899, recommendations and suggestions as to subjects for discussion.

Respectfully submitted for the Council.

ALEX. C. HUMPHREYS, President.
ALFRED E. FORSTALL, Secretary.

On motion of Captain White the report of the Council was received and its recommendations were adopted.

REPORTS OF TREASURER AND SECRETARY.

The report of the Treasurer, which was vouched for by the Finance Committee and which brought the accounts up to September 30, last, showed a total receipt of $2,885.52, an expenditure of $2,712 88, and a balance of $452.58. The report of the Secretary, respecting the state of the membership rolls, on date of September 30, showed that there were 8 honorary, 407 active and 67 associate members. Three deaths had occurred, 6 active and 2 associate members had resigned, and 7 active and 3 associate had been dropped from the lists. The reports were adopted without dissent.

The President called for reports of Special Committees. The first submitted was the

REPORT OF THE TRUSTEES OF THE GAS EDUCATIONAL FUND,

which the Secretary read as follows:

To the American Gas Light Association and Subscribers—Gentlemen: The trustees appointed at the 26th annual meeting of the Association, Oct. 19, 1898, to administer the fund, subscriptions to which had been secured by a Committee of the Council, for the purpose of carrying on for a period of at least five years the educational work begun by the Association in 1895, submit the following report of their work from the time of their appointment to Oct. 1, 1899:

A temporary organization was effected Nov. 9, 1898, and a Committee on By-Laws and Methods of Procedure appointed. The report of this committee, which recited the various reports to, and resolutions of the Association leading up to the appointment of the trustees and contained by-laws embodying the instructions set forth in the final resolutions, appointing the trustees, was received and adopted Jan. 27, 1899, and permanent officers at once elected in accordance with the by-laws. These officers are Walton Clark, Chairman; Eugene Vanderpool, Treasurer, and Alfred E. Forstall, Secretary. Suitable office rooms, which include a room set apart for the use of members of the Association and other subscribers to the fund, were secured at No. 58 William street, New York city, and the work of the trustees taken up.

This work has been planned to include not only the educational work, but also the collection of information and statistics of value to the subscribers to the fund.

The educational work is carried on by means of a correspondence class in continuation of the work previously done by the Committee on Education. The class is composed of employees of gas companies, the positions held varying from workman to general manager, the only condition for admission being the endorsement of applications by a member of the Association or a subscriber to the fund. It is at present divided into two sections, the advanced, containing those who have followed the course since the beginning of the work in 1895, and the second, containing those admitted from December 1st, 1897, up to May 1st, 1899. As it has been decided to limit the length of the course to three years, the members of the advauced section will be considered as graduated at the end of this year, while the members of the second section will be carried on for two years longer, and a new section started at the beginning of each year. There will thus be three sections after January 1st, 1901. The experience of the Committee on Education having shown that four sets of 12 questions each per year are all that the members of the class can answer satisfactorily, the practice of sending out one set of questions to each section every three months has been adopted. The questions deal with practical subjects and with those theoretical points a knowledge of which is necessary in order that the practical problems continually arising in gas works may be fully understood and correctly solved. Up to date three sets have been sent out to each section, the students being required to send in their answers to each set within two months after receipt by them. These answers are all looked over carefully by the Secretary, and a letter criticising the work sent to each student with the answers to the questions prepared by the trustees. Samples of these questions and answers, and of the circulars sent out to the class are appended to this report. The total enrollment in the class has been,

Advanced section	35
Second "	131
Total	166

Following the practice of the Committee on Education, all students who fail to send in answers to any set of questions without giving a good excuse for such failure, forfeit their membership in the class. There are also some who find it impossible to keep up with the work and are forced to resign. These causes have reduced the membership from this total and it is at present,

Advanced section	19
Second "	81
Total	100

There are on file at this date 12 applications for admission to the class, Jan. 1, 1900. Requests for application blanks are being continually received, and the present indications are that a large addition will be made to the class on the date mentioned. The students show great interest in the work and evidently devote considerable time to the preparation of their answers.

The collection and filing of information includes the keeping on file of the principal gas journals published in the English language, a card index of the valuable articles being made and kept up to date, and the collecting of such of the decisions of the State and Federal Courts as are of interest to gas companies, together with information regarding proceedings having for their object the transfer of the gas supply of any town from private to public ownership, or the granting of a franchise to a competing company. The value of this branch of the work will increase greatly the longer it is kept up.

Believing that the usefulness of their work could be greatly increased were they in possession of a larger income, the Trustees have continued to solicit and have secured further subscriptions to the fund amounting to nearly $1,000 per year. The number of subscribers is 92, the subscriptions varying from $1 to $1,000 per year. A number of subscriptions have been made in lump sums and only one fifth of such subscriptions have been regarded as available for any one year.

The following statement shows the total subscriptions made and the receipts and expenditures up to and including October 2d:

		Per Year.
Total amount of subscriptions	$20,609.80	$4,121.96
Total cash received to Oct. 1	6,441.80	
Advance payments not applicable to this year's expenses	2,324.84	
Total paid in on account of subscriptions for current year	$4,116.96	
Still due	5 00	
Total available for current year		$4,121.96
Expenses.		
Salary of Secretary, 9 months	$2,250.00	

Office rent, 9 months	215.00	
Furniture for Association room	30.00	
Printing, stationery, postage, etc	259.99	
Cuts for illustrating answers	35.98	
Total expenses		2,790.97
Balance		$1,330.99
Total amount paid in		$6,441.80
Total expenses	$2,790.97	
Surplus invested in Binghamton gas bonds	1,950.28	
Total paid out		4,741.25
Balance on deposit with National Newark Banking Company (pass book shows $1,953.67, from which must be deducted amounts of checks Nos. 21 and 22, equal to $253.12, leaving balance of $1,700.55)		$1,700.55

Respectfully submitted,
Trustees Gas Educational Fund,
WALTON CLARK, Chairman.
New York, Oct. 2d, 1899. ALFRED E. FORSTALL, Secretary.

On the suggestion of the President, this report was ordered placed in full upon the records. The moving motion was made by Mr. George B. Neal.

Mr. A. S. Miller read the following

REPORT OF COMMITTEE ON RESEARCH.

To the American Gas Light Association—Gentlemen: There were no special subjects referred to your Committee for action during the past year, and no investigation was undertaken as a Committee. Through its efforts, however, one or two papers have been obtained, which are records of original investigation.

It is a matter of great regret that no papers are prepared for this meeting of the Association on the subjects already suggested. "The Self-Enrichment of Coal Gas" as a subject has not been worn threadbare, and we earnestly hope that one or more members will favor us with a record of their experiences at the next meeting. It is to the interest of every member that this subject be threshed out new. If the members would only figure the saving that would be made if an additional candle can be added to the illuminating power of the gas they would realize how well they can afford the time and expense of the investigation. The following subjects still invite investigation:

The measurement of high temperatures.

The removal of tar from water gas.

At what point should coal and water gas be mixed in a combination works to insure the best results?

The production and separation of cyanides.

The effect of regenerative benches and anti-dips on the production of ammonia.

Will not some of the members volunteer to take up one or more of these subjects? If the members who do not write only knew it, the expense and trouble of the preparation of a paper are more than repaid by the knowledge gained.

Inquiry among the pipe founders develops the fact that the standard hubs and flanges are not generally specified. In future we hope that these will always be specified. The member who specifies them will find that he is helping himself more than the Association.

We would be pleased to have further suggestions of subjects for research. Respectfully submitted, ALTEN S. MILLER,
CHAS. F. PRICHARD.

REPORT OF COMMITTEE ON NOMINATIONS.

The report of the Committee on Research having been received and ordered placed on the record, Mr. Butterworth, from the Committee on Nominations, handed in the following names as its choice of those suitable to direct the affairs of the Association in an official capacity.

NEW YORK, OCTOBER 18th, 1899.

American Gas Light Association—Gentlemen: Your Nominating Committee report the following nominations:

For President—Mr. George G. Ramsdell, Phila.

For First Vice-President—Mr. E. G. Pratt, Des Moines, Ia.

For Second Vice-President—Mr. William R. Beal, New York.

For Third Vice-President—Mr. Alten S. Miller, New York.

For Secretary and Treasurer—Mr. Alfred E. Forstall, Montclair, N. J.

Council (for two years)—Messrs. E. G. Cowdery, Milwaukee, Wis.; John Young, Allegheny, Pa.; H. H. White, Portsmouth, Va.; Paul Doty, Grand Rapids, Mich.

Respectfully submitted,
IRVIN BUTTERWORTH, Chairman.
F. C. SHERMAN,
KERR M. MITCHELL,
W. MCDONALD,
R. M. DIXON,
} Committee.

ELECTION OF OFFICERS.

On motion of Captain W. H. White, Mr. G. B. Neal was instructed to cast the ballot of the Association in favor of election to office of the gentlemen named by the Committee. Mr. Neal having announced the result, President-elect Ramsdell, in very clever speech, thanked the Association for the honor it had conferred upon him and asked the members for their assistance to the end that the next meeting would equal or exceed in interest and value any that were now matters of record.

On motion, Captain W. H. White, Mr. A. B. Slater, Jr., and Mr. S. F. Hayward were appointed a Committee to Name Next Place of Meeting.

SOME COMMUNICATIONS.

The Secretary read letters from Mr. H. E. Gawtrey, President Consolidated Gas Company, of New York, from Mr. Russell Sage, President Standard Gas Light Company, of New York, from Gen. Jas. Jordan, President of the New Amsterdam Gas Company, of New York, and as President of the Brooklyn Union Gas Company, of Brooklyn, N. Y., inviting the members and guests to visit and inspect the works of the several named Companies at any time during the meeting of the convention.

Captain W. H. White, as Vice-President of the Lotus Club, of New York, extended a hearty invitation to the Association to avail itself of the privileges of the Club. He assured the delegates that the Association button would be the power that opened hospitably to them the Club's doors.

On motion, the invitations were received, and the Secretary was instructed to make suitable formal acknowledgment thereof.

A JAPANESE AMBASSADOR.

Captain W. H. White at this point formally introduced to the meeting Mr. G. Nakagawa, Chief Engineer of the Tokyo (Japan) Gas Company, who was visiting this country with a view to familiarizing himself with the American gas practice. He was present as the specially invited guest of the Association. The Captain's introduction asked that the right hand of fellowship be extended to the gas man from the far East. When the applause which greeted Mr. Nakagawa's simple bow in acknowledgment had subsided, Vice-President Ramsdell assumed the chair, and President Humphreys read his

INAUGURAL ADDRESS.

[For the Address, see JOURNAL, Oct. 23, page 647.]

On motion of Mr. C. F. Prichard, the address was referred to a Committee of three (Messrs. C. F. Prichard, B. E. Chollar and Robert Young) for consideration and report.

The Secretary then announced the reception of several letters regretting the inability of the writers to be present at the meeting. Those read were respectively by Mr. Jas. W. Dunbar, Secretary Western Gas Association, and by Mr. E. H. Jenkins, of San Antonio, Texas.

READING THE PAPERS.

The President then introduced Mr. A. H. Strecker, of Newark, N. J., who read the following

NOTES ON PREPAYMENT METERS.

This paper was written some time ago for presentation at a similar gathering. It is now presented to you on the request of your Secetary, not so much because of its intrinsic value, but rather because it touches upon a modern and important subject, and because it is expected to bring on a full discussion and give the Association the benefit of the experience of many other members. This pre-payment meter question has two sides, a technical and a commercial one. Of the former, as far as it relates to the mechanism of the attachment, the difference in and the relative merits of the various makes, I have little or nothing to say, especially as I do not wish to appear as the champion of any particular make. I merely desire to give you a short account of what we experienced in introducing this meter and some deductions drawn from this experience.

The Newark Gas Company had been considering the advisability of the introduction of these meters for some time. We had been experi-

menting with various makes, and had followed the progress made by others, when finally we went into this business in a regular way about July 1st, 1897.

To begin with we laid down certain rules for the guidance of our men in the introducing and setting of these meters as well as for our customers. These rules provided, for instance, that they, being receptacles of money, should be set only in safe places, like stores, or the cellars of houses, which were under lock and key. Then they should be furnished only to parties who, in the judgment of our inspector, had some degree of responsibility. Consumers in signing application for pre-payment meters bind themselves to protect the same from injury or from being tampered with, and to burn gas according to the regulations of the Company.

Right here we met with a difficulty. Our custom and rules provide that the service pipe should end at or near the front wall of a house, in the cellar or basement, where the meter or meters are placed. All risers start from this point. Now, this rule made the placing of slot meters a somewhat difficult problem. In private houses, where the cellars would be locked and in charge of one party only, we had, of course, no trouble. In the case of stores, saloons, etc., located on the first floor, we would extend the service up from the cellar and set the meter in the store itself under the eye of the proprietor. But in the case of tenements or flats, where the cellars would be accessible to a number of people, and which frequently would not be locked at all, considerable of a risk would have to be taken by placing meters therein. However, owing to the eagerness of our agents to introduce these meters, these risks were taken at times with rather disagreeable results as will be related later on.

The price of gas sold through these meters was at that time fixed at $1.25 per 1,000 cubic feet, or at the rate of 200 cubic feet for each quarter dollar deposited in the money box. Our regular retail price for gas sold through common meters was $1.20 per 1,000 cubic feet. The extra charge of 5 cents per 1,000 cubic feet was intended to cover interest, etc., on the cost of these meters above that of the ordinary type.

We introduced the prepayment meters almost entirely by soliciting. We employed canvassers, working on commission, by making them a certain allowance for each application passed and meter set. The applications, which these men brought in, would be given to an inspector, whose duty it was to examine the various premises applied for and to decide upon the practicability and advisability of placing slot meters there.

First, and foremost of course, we canvassed houses where we already had services and which we repiped for gas. Occasionally we found some good prospective customers in houses not connected with our mains and without house piping. In such a case we did provide a service free of cost (a charge for such being otherwise the custom in those days), ran a limited amount of piping outside the plaster work and even provided some cheap, home made fixtures. Although we did comparatively little of this work, what we did do called forth a protest from the "Master's Plumbers' Association" as interfering with what they considered their legitimate business.

Going on in this way we met with much success and managed in the space of about 18 months to put out nearly 3,500 of these meters. This number practically represented new business. To be sure, after the meters had been fairly introduced, we had frequent applications at the office for the removal of the ordinary and the replacing of the same by the slot meters. We would, however, either flatly refuse to do so, or in some other way avoid making the change. In most cases it was undoubtedly the novelty of the thing which made old customers ask for them; again, people got an idea they would get gas more cheaply by their use; and still others probably felt confident of being able to beat the machine.

Almost all makers of prepayment meters are represented in our collection, besides a number of old meters provided with one or other of the patent attachments and cash boxes. Up to the beginning of this year we put out 3-light meters only; since then we are using the 5 light variety.

We have had trouble almost from the start about the cash found in the boxes being, in a number of cases, short of the amount indicated by the regular index of the meter. This failing was not by any means confined to any particular make of meter, but it happened to some extent with all of them. Upon examining the delinquent meters, we found in a number of cases faulty action of the shut-off valve, which is connected with the prepayment mechanism. This valve should gradually close and stop the flow of gas when the quantity purchased had been delivered; but in the cases mentioned the valve would fail to seat itself properly and would allow enough gas to leak through to keep at least one burner going. One firm of meter makers overcame this difficulty by adding to the mechanism a lever, which would arrest the movement in case that valve would refuse to close and gas continue to flow. No doubt some of the meters had been tampered with. Some of the earlier makes of them were easily beaten. I have seen a bent strip of metal, like the piece of the spring of a clockwork, used on them with great success. A meter thus operated upon would yield any amount of gas without receiving a single coin. Later makes have been so improved so as to make such cheating more difficult. All these shortcomings of the meters amount in the aggregate of the year 1898 to just about 2 per cent. of the gas registered; that is to say, we received that much less than the figures calculated from the regular index of the meters would amount to.

As to actual robbing of the money boxes, we had hardly any trouble on this account, during the first year of having these meters in use. Only sporadic cases were heard of occasionally. But during the spring of this year we experienced a regular epidemic of this class of burglary, which lasted for quite some time, although we set the police to work and hunted down some of the criminals. Boys, or young fellows of bad character, had gotten on to the construction of these meters and worked them on a scale of considerable magnitude. As mentioned above, we had been taking some risk in setting these meters in the cellars of flat houses. It was an easy matter for the thieves to get into these, and the flimsy construction of the money boxes enabled them to open and rob the same without much trouble, hardly using any tools to do it with. A twist of the padlock would do the trick. In some cases, especially where only one party had access to the cellar, we managed to collect the loss from him; but in many others we had to stand it, together with the expense of repairing the damage done to the meter. I understand that the New York gas companies, where the prepayment meters are in extensive use, to avoid this trouble and loss, set the meters in the apartments of the consumers, where the latter can protect them. In order to do this the service pipe has to be extended throughout the house, with outlets in the various apartments. As mentioned above, this is not in accordance with our rules; our houses are not fitted for it and we did not care to make the change. We had, however, all meters removed which had been set in places not entirely safe, and in this way greatly checked the robberies.

Repairs to prepayment meters naturally cost considerably more than those to the common ones. In the first place, there is more to get out of order, and, then, in several makes the prepayment mechanism is in the way of getting at the valves for the purpose of grinding them and has to be removed and replaced, which makes ordinary repairs more costly.

From our experience we have learned that there is a great deal more labor connected with the handling of these meters than with common ones. Since their introduction we have had to increase our force of complaint men steadily. Looking over our returns of complaints for the past few months I find that just about 10 per cent. of them are marked "Trouble with P. P. Ms."—this meaning specific complaints connected with these meters; and this is entirely outside of complaints in common to both classes of meters, like sticking, flickering, etc. Many of these "specific complaints" are rather frivolous ones. Sometimes our men find only a quarter wanting to make the meter go, or the quarter got stuck in the money carrier, or the consumer thinks he is not getting gas enough for a quarter, and so forth. But all these calls have to be answered, and this work takes up time and costs money.

A change in the price of gas, when you have several thousand of these meters out, is quite a piece of work. In all makes but one it means opening the money box, detaching the change wheel and substituting for it another, making sure that everything works all right and closing and locking the box.

The taking of states and emptying the boxes of coin is necessarily a much slower operation than taking the readings of common meters. Three men at prepayment work accomplish only about as much as two on regulars. Of course, in the case of prepayment meters there is no subsequent collecting. But in a town like ours, where there is a discount allowed on bills paid at the office within five days, there is not very much such collecting to be done, and the delinquent consumer practically pays the cost of collecting by losing the discount.

All these considerations lead to the question: To what extent and under what circumstances is the prepayment meter a commercial success?

I think that in our town the prepayment meter has been such a success only in a qualified way. It is about like this. The 3,500 meters in use show the lowest average gas consumption of the whole, only about 10,000 cubic feet per annum, which is a good deal less than the

corresponding figure for the common 3 light meter. We have consequently in 18 months built up a business of about 35,000,000 cubic feet annual consumption, which is quite satisfactory, and in a great measure it is a steady and staple business. Changes among consumers will be frequent, but, taken as a whole, the business will be constant and even increasing. A comparatively small number of heavy consumers, like stores and mills, might easily use as much gas annually as these 3,500 prepayment customers. But their trade would not be nearly so steady, and would easily be affected by stagnation in business, change in methods, the establishment of private lighting plants, etc. But on the other hand, the capital invested in a plant catering to the wants of the prepayment meter consumers would have to be considerably larger than that of a plant doing more or less of a wholesale business, and the expenses connected with the selling of gas to the former would be considerably larger than to the other class of consumers.

The 3 light prepayment meter, including connections and the average allowance for house fitting which we had to do, stands us about $6 higher than the ordinary one. Allowing 15 per cent. of this sum as an annual charge for interest, depreciation and repairs, we have 90 cents for a yearly consumption of 10,000 cubic feet, or

Per 1,000 cubic feet	9.0 cents.
The loss by leakage of valves, by cheating and stealing is 2 per cent., as stated above, or per 1,000 cubic feet	2.5 "
Extra labor, making exchanges and attending to above mentioned specific complaints, estimated per 1,000 cubic feet	3.0 "
Extra cost of taking states and making collections, per 1,000 cubic feet	1.0 "
Total	15.5 cents.

In other words, the gas sold through prepayment meters should be charged at a rate, say, 15 cents higher per 1,000 cubic feet than that sold through the ordinary type, so as to come out even. If such a distinction in charges is not made, then I cannot see that their introduction is an entire success or an unqualified benefit to the business. You have to increase your expenses and you do not get a proper return for it. I do not remember what view is taken of this subject in London, the original home of the slot meter, but I came the other day across the recent proceedings of the German Association of Gas Engineers, which bears on this subject. It appears from that that 10 gas works charged on an average per cubic meter, for light, 16.4 pfennig, for heat, 12.2 pfennig, and through slot meters 19 2 pfennig, showing that their owners regard the matter in about the same light.

Or, to take another view of the problem, a good share of this prepayment meter business might have been obtained by offering ordinary ones under liberal conditions, that is, by asking only small deposits, or, where people appeared trustworthy, no deposits at all, also by doing a little house fitting gratis. By frequent and close collections and by general sharp attention to business, the losses through bad debts could not have been very heavy, certainly not exceeding 5 per cent. But, referring to the above figures giving the extra cost of prepayment meter gas, a loss of 12 per cent. might have been suffered and things would then be about even.

On the other hand again there are many consumers who can be obtained only by offering to set slot meters. Certain people can not stand gas bills which have to be met when presented. They may be willing enough at the end of the week, when wages have been received, to drop a quarter or two in the slot; thus purchasing gas for the coming week, just the same as they would be buying kerosene at the store. I think that these people comprise the largest part of our prepayment customers. They are, however, the most modest users of gas of all, and robberies, etc., occur mostly in their tenements.

This, gentlemen, is a review of my experience with the prepayment meter. Let everybody draw his own conclusions and fit the case to his own circumstances. In some places the introduction of these meters may not pay at all. In others, when properly handled, it may be an entire success and l ad to considerable expansion of business.

[A useful discussion followed. We regret that we are at this time unable to print a summary of the discussion on the Strecker and Roberts' papers, since the rules of the Association, as interpreted by its officers, preclude our reporting thereof, until the various speakers have had an opportunity to correct their remarks.]

Mr. George J. Roberts, of Philadelphia, Pa., then read his paper on

THE PUMPING OF GAS.

The rapid growth of cities, especially in the suburbs, and the tendency toward manufacturing all the gas in one or two large central stations, force the engineer to study the question of pumping gas in solving the distribution problem.

There are two distinct problems. One is to pump the gas direct through high pressure mains to outlying holder stations and there distribute from these; the other is to reinforce the pressure in the distributing mains by pumping gas direct from the holder into the distribution system. In the latter case, it will usually be found advisable to use a fan exhauster without regard to its efficiency, since it is more important to keep a constant pressure in the main, and thus do away with the jumping or fluctuations of the gas flame.

The object of this paper is to give such data as will help the engineer to determine the kind and size of pumping plant that will best suit his case. With this object in view, I had made for me certain tests, which are given in the tables attached hereto.

The first three tests were made at the 25th Ward Station in Philadelphia; the fourth and fifth tests at the Point Breeze Station, Philadelphia. In both plants Wilbraham exhausters were used. The sixth, seventh and eighth tests were made using a Sturtevant fan exhauster.

In making these tests I desired to find out if there was any loss in candle power in pumping gas under 50 inch, 30 inch and 20-inch head, and if there was at what pressure this loss in candle power would cease. I also wished to determine the efficiency of the exhausters working under different pressure.

To get the high pressure it was necessary to throttle the inlet valves of the outlying holders. The only cases where there was no throttling were in the fifth, sixth, seventh and eighth tests. In no case was there any loss in candle power.

Referring to the attached tables, columns 1 to 16, inclusive, contain the observed data. From these the slip of the exhausters, the efficiency of the plant, the value of the constant C in the formula for calculating the flow of gas through pipes, and the formula for determining horse power necessary for any contemplated plant are determined.

From the data given in columns, 3, 6, 7, 8, 13 and 14, we can find the value of C in the equation $Q = C\sqrt{\frac{h \times d^5}{G \times l}}$, since these give the value of Q, G, d, l and h.

This value of C is given in column 24.

Column 17 gives the useful work done; or, in other words, the actual work in moving the gas. This is calculated as follows:

$$\text{Horse power} = \frac{V\,H \times .036 \times 144}{33{,}000}$$

V = Velocity of flow per minute in feet.

H = Net head at the exhauster (column 22) in inches of water.

.036 = the equivalent of 1 inch water in pounds per square inch.

V is calculated from the volume of gas pumped at its temperature and pressure at outlet of exhauster.

$$\text{Efficiency} = \frac{\text{result in column 17}}{\text{result in column 16}} = \text{result in column 18.}$$

Column 5 gives the revolutions per minute of the exhauster necessary to overcome the slip, or that gas which leaked back past the exhauster blades.

To obtain this figure the outlet valve of the exhauster was closed and the exhauster was run at a speed necessary to maintain the outlet pressure of the tests, the inlet pressures being kept the same as in the tests.

In tests 5, column 4 gives the revolutions of the exhauster, 182, and the slip (column 5) as 38. In explanation of this it should be said that two exhausters were being run at the same time, and the revolutions of the two exhausters and the slip of the two exhausters were added together. Thus the slip is given as 38 revolutions, while, in fact, the slip of each exhauster was only 19 revolutions.

$$V' = \frac{Q}{R\,R'}$$

$$V = \frac{Q}{R}$$

V' = Volume of gas that would be delivered per revolution of exhauster if there were no slip.

V = Volume of gas actually delivered per revolution of exhauster.

Q = Volume of gas delivered per minute.

R = Revolutions per minute during test.

R' = Revolutions per minute when outlet valve was closed.

$$\text{Percentage of slip} = \frac{C'}{C}$$

C' = Net capacity of exhauster.

C = Gross or figured capacity of exhauster.

1	2	3	4	5	6	7	8	9	10	11	12
Test No.	Make of Exhauster.	Vol. of Gas per Hr. at 60° M.	Revolutions Per M. Exhauster.	Slip Revolutions per M.	Specific Gravity Gas = G.	Dia. Main Inches. = d.	Length Main in Yards. = l.	Temp. Inlet Exhauster.	Temp. Outlet Exhauster.	Temp. at End of Main.	Press. at Inlet Exhauster.
I.	Wilbraham	181.0	87	27	.62	30	6,700	75°	95°	68°	3.9″
II.	"	193.2	82	16	.62	30	6,700	73	87	65	2.8
III.	"	211.6	83	12	.62	30	6,700	72	83	64	2.5
IV.	"	145.0	73	27	.64	30	4,760	75	93	75	8.3
V.	"	455.0	182	38	.64	30	4,760	74	87	75	8.0
VI.	Sturtevant 8-B Fan.	58.8	832	✓	.62	16	3,720	67	70	63	5.8
VII.	"	59.1	828	✓	.62	16	3,720	63	69	59	5.9
VIII.	"	148.3	2,131	✓	.61	16	3,720	63	71	57	6.2

1	13	14	15	16	17	18	19	20	21	22	23	24
Test No.	Press. at Outlet Exhauster.	Press. at End of Main.	Net Head = h.	Indicated Horse Power.	Horse power Useful Work.	Efficiency of Plant.	Capacity of Exhauster Rev. Gross. Cu. Ft.	Capacity of Exhauster Rev. Net.	Per Cent. Slip.	H. Net Head at Exhauster.	H.P. per M. per Hr. per Inch Head.	C, in Formula $Q = cx\sqrt{\frac{h \times d^5}{G \times l}}$
I.	51.5″	48.7″	2.8″	43.4	22.18	.51	50.0	34 3	31	47.6″	.00504	1,416
II.	30.9	27.9	3.0	26.2	14.00	.53	50.0	39.3	22	28.1	.00484	1,450
III.	19.7	16.1	3.6	19.7	9.67	.49	50.0	42.5	15	17.2	.00541	1,465
IV.	51.1	50.1	1.0	36.9	15.20	.41	52.6	33.1	37	42 8	.00590	1,624
V.	17.2	6.6	10.6	18.2	11.13	.61	52.7	41.7	21	9.2	.00435	1,565
VI.	8.5	3.4	5.1	3.34	.42	.13	1.1	✓	✓	2.7	.02105	1,220
VII.	8.5	3.4	5.1	3.20	.41	.13	1.2	✓	✓	2.6	.02082	1,228
VIII.	22.0	4.0	18.0	22.00	6.36	.29	1.2	✓	✓	15.8	.00940	1,639

EXHIBIT A

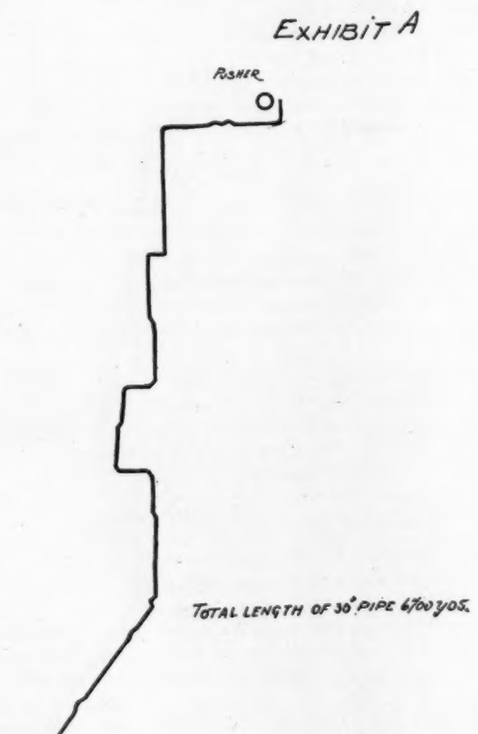
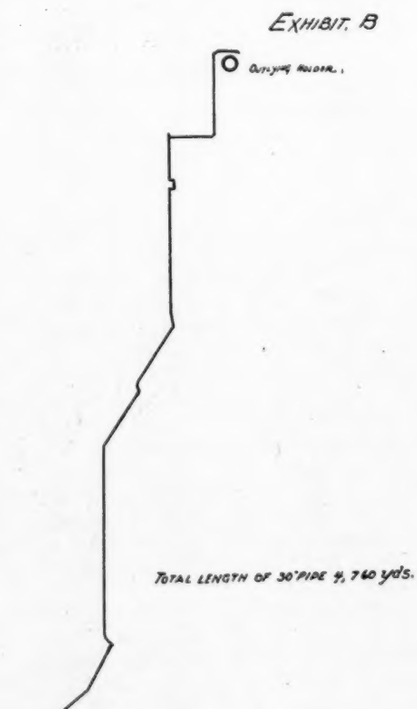


EXHIBIT B



The average of the results in column 23 for horse power required per 1,000 per hour, per inch head for a Wilbraham exhauster, is .00511, so that with this style of exhauster, and within the range of the pressure in column 22, it is fair to accept as a practical equation:

HP=.00511 × H × Ms.

For fan pusher the equation is: HP=.01 × H × Ms.

H=Net head pumped against.

Ms=Thousands of cubic feet per hour.

It is interesting to note that the efficiency of the plant increases with the revolutions of the exhauster and amount of gas pumped; that the slip varies with the net head at outlet of exhauster (=H).

Exhibits A, B and C show the general character of the mains experimented upon.

Tests 1 to 3, inclusive, were in connection with Exhibit A; 3 and 5, Exhibit B; 6, 7 and 8, Exhibit C.

It may be interesting to note the fact that the results given in column 17 check very closely with results that would be obtained if this question were treated as a heat problem as follows: The useful work in pumping gas consists only in compressing it and giving it velocity. The only result of compression is a rise in the temperature, if we assume the gas to be compressed adiabatically.

The formula for adiabatic compression of gas is—

$$L_c = \frac{GC_p}{A}(t_2 - t_1)$$

L_c = Foot pounds per minute.

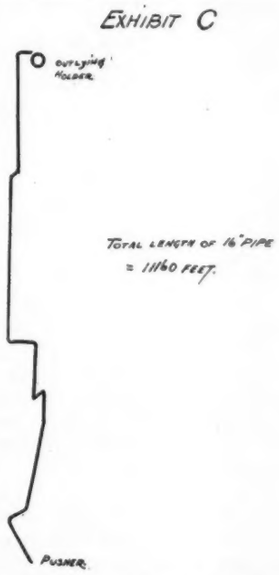
G = Weight of gas pumped per minute.

$A = \frac{1}{778}$

C_p = Specific heat of gas at constant pressure.

(See Röntgen on "Compressed Air," page 334).

t_1 = absolute temperature on inlet to exhauster.



t_2 = absolute temperature on outlet of exhauster due to compression alone. From analysis of the gas pumped in these tests the specific heat is found to be .45.

To find t_2 we have:

$$t_2 = t_1\left(\frac{p_2}{p_1}\right)^{\frac{k-1}{k}}$$

k = ratio of specific heat at constant pressure to specific heat at constant volume, which, for a perfect gas, is 1.4.

p_2 = pressure at outlet of exhauster in pounds per square inch.

p^1 = pressure on inlet of exhauster in pounds per square inch.

t_2 is not the observed temperature at the outlet of the exhauster, since some of the rise in temperature is due to friction.

The rest of the useful work as stated above is expended in giving velocity to the gas and is expressed by formula, $L = \frac{1}{2} M V^2$.

L = foot-pounds per second.

M = weight of gas pumped per second divided by 32.16.

V = velocity per second.

Thus solving for useful work test 5, column 17, we have:

$$t_2 = t_1\left(\frac{p_2}{p_1}\right)^{.29} \qquad \frac{k-1}{k} = .29$$

$$t_2 = 535\left(\frac{15.319}{14.988}\right)^{.29} = 538.2$$

455,000 cubic feet gas per hour = 7580 cubic feet gas per minute.

7580 cubic feet gas weighs 345 pounds.

Thus we find from the tables that—

G = 345, $(t_2 - t_1) = 3.2$

$C_p = .45$

Substituting in formula $L_c = \frac{G\, C_p\, (t_2 - t_1)}{A}$

We get L_c = 386,510; or 11.71 horse power.

$\frac{1}{2} M V^2$ = .2 horse power.

Thus we have from the formula useful work = 11.91 horse power against 11.13 horse power, as shown in column 17 of the table.

Taking into consideration the fact that the quantity of gas pumped was figured from holder measurements and that we cannot make absolute observations, and that illuminating gas is not a perfect gas, I consider that this is sufficiently close for confirmation of figures given in column 17. I will also add that all eight tests were figured in this manner and found to confirm the figures given in column 17.

From the above we find that the positive exhauster[1] is more efficient than the fan exhauster, and to get the greatest efficiency it is necessary to run the exhauster up to its maximum speed. The low efficiency of the fan exhauster is due to the restricted inlet, gas being taken on one side only.

There is no loss in candle power up to a pressure of 50 inches. Therefore a high pressure can be maintained in transferring gas from the central station to the outlying holder stations, thus making a saving in cost of pumping main.

I wish to express my thanks to Mr. J. A. P. Crisfield, who had charge of these experiments, for his valuable assistance and suggestions. And it is his careful personal attention that has insured the reliability of the data from which these conclusions are drawn.

1. See "Kent's Handbook," pages 511 to 523, for tests on blowers, which shows how the efficiency of blowers decreases with reduction in size of opening for admission of air. It will be well to read this before deciding upon size of fan exhauster.

[To be Continued.]

[From *Engineering*.—Continued from page 655.]

American Competition.—No. IV.[1]

It may be of interest to examine shortly some of the causes which enable American manufacturers to compete in the British market in lines of engineering goods which we have always considered to be our own specialty.

The low cost of raw material, and the enormous production of iron and steel under more favorable conditions than exist in any other part of the world, give the American manufacturers a great advantage. Other important factors contribute not a little in cheapening and increasing the rapidity of output in the United States. In most cases the American manufacturer devotes himself to the production of a given line of standard articles, and no trouble or expense is considered too great to simplify or improve the manufacture of the specialty, by designing machinery which may do away with skilled labor. The human factor is eliminated as much as possible, thus lessening the chance of error, while giving to the workman facilities which are rendered impossible here by trades union laws, to earn maximum wages with a maximum output, to the mutual benefit of employers and employed. An approved design once decided on is reproduced by the thousand, and deviation therefrom avoided; but the maker is quite sure in the first place that the design is the best that can be obtained.

Large British shops follow a contrary practice and are often prepared to make, and do make, a variety of things while possessing but few special machines; thus the advantages of constant reproduction are lost, much unnecessary labor is involved, and the finished product is at once more costly and less perfect than if it had been manufactured automatically. Unconsciously the consulting engineer is largely in fault for the existing state of affairs. In too many cases the desire to father a new design preponderates over the advantage of keeping close to recognized standards. On the other hand, the American believes that the manufacturer is a higher authority as to his own specialty than any consultant can possibly be. The maker is therefore put upon his mettle, and the goods produced are sold on his guarantee of their fitness, not on the basis that they comply with a given specification.

English engineering shops no doubt possess admirable mechanical appliances for doing certain work, but there is with us an unfortunate tendency to be content with them because the work they do is good. In America the owner or manager of a shop does not rest satisfied, but is always on the lookout for improved methods whereby the work can be done more quickly, and of course as well. The result of this constant striving to do better things, mechanically speaking, is that machine tools are regarded as temporary, not permanent, means to an end. In no first-class American works is obsolete machinery to be found. It is often the rule to regard eight years as the full life of a machine; at the end of that time it is expected to be out of date and must be replaced by another more efficient; depreciation charges in shop accounts are charged on this basis. The result of this constant striving after better things is to stimulate master and man alike, keeping the former keenly on the look out for improved processes, and encouraging the latter to devise new methods for increasing and bettering output. Constant changes are thus in progress, and probably experience has taught the American manufacturer seldom to make a mistake when he makes a change.

The United States has a far greater home market than Great Britain; its customers have become accustomed to certain fixed lines of products. American manufacturers can therefore standardize and reproduce in great quantities more easily than we. In foreign markets America is, at least, in one respect, on a far better footing than ourselves. The very low through freight rates that it is possible to obtain in America, owing to the combination of railway, dock and shipping interests, greatly affect the question. Rates per ton are cheaper between, say, Chicago or St. Louis, and any English or Continental town, 4,000 or 5,000 miles away, than between English or Continental towns, separated by but a few hundred miles. British railway freights are ruinous.

The English manufacturer is generally reluctant to expand. In but very exceptional instances is he willing to risk enlarging his shops to accommodate prospective orders. In America the reverse is the case. Manufacturers are always ready to enlarge. The American

1. The author of this article, a well known English engineer, prefers that his name should not appear.

may pride himself on being ahead of any other nation, but this does not prevent his adopting advantageous methods which he sees abroad. The Englishman is too conservative to willingly try foreign methods. Until recently the average Englishman was profoundly ignorant of what was being done abroad, and was unwilling to believe any statement which he had not verified with his own eyes. During the disastrous times that followed the great panic of 1893, many of the American manufacturers spent great sums in extending and equipping their works, to have them in readiness for the busy times which they foresaw that reaction would bring to their home trade, but without realizing that these extensions would prove inadequate to fill the demands of foreign markets. In this country it is too often the rule for manufacturers to complacently turn away work during busy periods, resting content with the means at their disposal to work at full capacity, and shrinking from the cost of expansion in the time of enforced inactivity. Thus, when the next series of bad years come, they will find their American competitors in a far better position than themselves to get such work as foreign markets will offer.

Nearly all large English concerns are managed and controlled by elderly men—men doubtless of great capacity, but who naturally are unwilling to try new methods with which they are unacquainted. In America the reverse is usually the case.

A vital point in which we are far inferior to America is in our technical colleges. These are certainly better than they were, but they still leave much to be desired. The narrow-minded policy of trade unions existing in this country is also a fertile source of trouble. It is a fact that a very large number of the skilled foreman in those American workshops which are inundating the world with their products, were originally British subjects. In America the harder a man works the better he is paid, and there is little time or inclination for loafing. Great encouragement is also given to the inventiveness of the men. We find English, Scotch, Irish, Welshmen, Danes, Norwegians, Swedes, Germans and Swiss throughout America occupying high positions. They have become naturalized, and in many cases are more American than the Americans. They bring to bear upon the conditions that exist, the special knowledge which they have brought with them from their former homes.

The American and British manufacturer exhibit a marked difference as to their willingness to impart information to outsiders. The American, as a rule, will, without hesitation, take anyone through his works, show any novel methods which he may have adopted, and generally supply any information which his visitor may be anxious to acquire. English and Continental manufacturers do not throw open their works to the public. and are not anxious to supply information. The American, unlike his English competitor, is always anxious to learn from abroad what may be useful to him at home. This spirit, it is true, was more evident twenty years ago than it is now, and it was at that relatively remote time when Americans looked most earnestly to England as the great source of useful information, that we as a nation derided the idea that any mechanical good could come from across the Atlantic.

American engineers and managers may now be found the world over, studying the requirments of different countries. They try to impress foreign customers with the superiority of their goods, and send home most elaborate and valuable reports. They will manufacture exactly such goods as the special market may require, instead of forcing standard lines of products on those markets.

There is one field particularly in England which, owing to unfavorable circumstances as regards home competition, is practically in the hands of America. This is the field of electric traction and power transmission, including its steam, electric and other accessories.

The backwardness of this industry in England may be accounted for in great part by the stringent laws regarding electrical enterprise, laid down in the early eighties and the Tramways Act in 1871. These laws prevented the investment of English capital in such undertakings at home, and statistics prove that far more British capital is invested in foreign than in domestic electrical enterprise. America, unhampered by such laws and owing to natural conditions and requirements, is now far ahead of us in this class of work. One of the large electrical concerns in America has now in hand nearly fifty 1,500-kilowatt machines for railway and tramway work alone, and one manufacturer of steam engines is constructing eleven 10,000 horse power and eleven 6,000 horse power steam engines, not counting numberless engines of 3,000 horse power and under, for traction work only, at the present moment. It is evident that such shops can afford to lay down new machinery and spend large sums on experiments which result in the production of the cheapest and best machinery.

The phenomenal rapidity with which the resources of the United States have been developed, both of raw material and manufactured products; the high standard of excellence in design and promptness in execution, that has been reached, and which makes America a dangerous competitor not only to this country, but to our other dreaded commercial enemy, Germany, has been accompanied with certain disadvantages, which, belonging as they do to the ethical and social aspect of the question, do not fall to me for consideration. Devotion to business, to the almost entire exclusion of everything else, is one of the causes of American success; it has brought its triumphs, but not without cost. The American engineer, or business man, becomes perforce so engrossed in his work that there exists nothing else in the world for him. He has no choice but to become a slave to his business, and to maintain the pace that has been set in the race for success. Internal competition is so keen, to say nothing of the competition in the wider field he is now ambitious to occupy, that he cannot have a choice, or turn aside for rest, to the many ather occupations and relaxations that make life worth living, as we know it. It may well be that we err too much on the other side, treating leisure as the important business of life, and work as its unfortunate necessity. For the typical American work is the sole occupation of life. Educated, capable and energetic young men enter on their business career with a solemn earnestness of which we know little, and becoming absolutely absorbed therein find no leisure or inclination (except on brief occasions) to devote any part of their time to national or local politics. It matters little to them if misgovernment or abuses exist, so long as it does not affect their success. As a natural consequence, too, this concentration on business affects family and social life to a very large extent. Where these peculiar conditions will lead is a problem which, as I have said, does not fall into this brief discussion, but that it will play an important part in the nation's history is as certain as that the characteristic *laissez faire* of the Englishmen has set its imprint on the present generation of Britons.

Nearly all the American products which have inundated foreign markets are those in the manufacture of which little skilled labor is required. These goods, when once properly designed, are turned out with astounding rapidity, and the American has little patience with any product which cannot be reproduced in this fashion. Manufactures which require skilled and careful artisans throughout the process of production, do not, and probably never will, come from America. In this fact there is much food for thought.

There is another matter which, in considering possible and probable American progress, must not be lost sight of. I refer to the trusts and combinations, and to the one-man control which is such a large factor in American business, and which appears steadily and surely to bring the national wealth into a few hands. I could easily name a dozen men whose power and rule are as autocratic in their own lines as that of the Czar. So far most of these men have acted wisely in the main, and as long as this be the case there is nothing to fear. But should they, or what is more probable, should their successors, abuse the vast power vested in them, the consequences would be a social convulsion so far-reaching that the disastrous result to American industry is difficult to conceive, and would reduce, if not remove, the dangers of American competition.

An English View of the Iron Situation.

The London (Eng.) *Economist*, in editorially discussing the present iron situation, remarks:

The third quarter of the year has passed without any sign of reaction from the exceptional prosperity which has been enjoyed by the iron and steel trade for some considerable time past. All the indications are quite in the opposite direction, for notwithstanding the increased production throughout the world, there still appears to be a large and unsatisfied demand, which it is probable will task all the energies of the trade for some considerable time to come. What surprised and deceived so many was the unexpected and extensive development of this demand. During the year 1898 the United States of America, although producing 1,000,000 tons of pig iron less than in the present year, was able to spare about 600,000 tons for export to other countries. Now America is able to absorb the whole of her present production of 13,000,000 tons, and grudges the loss of such iron as is exported to fill orders taken some time since, and is no longer a seller for export. Considering the fact that stocks have been reduced in America at least 600,000 tons, it would appear that the consumption of the United States alone must lately have increased at least 2,000,000 tons. This is a condition of things so exceptional as to account for all that has happened during the present year. To a lesser extent a similar expansion has

been going on both in this country and Germany. Great Britain produced 8,631,151 tons of pig iron in 1898, and it is estimated that the production of the present year will be about 9,500,000. If one takes into account the reduction of stocks and the imports of pig iron, it may very fairly be assumed that the consumption of pig iron in England has increased about 1,000,000 tons. Again, in Germany the productive power of their pig iron furnaces has been strained to the utmost to supply the exceptional demand, but this being insufficient, they have drawn largely from this country such pig iron as they required for their rolling mills, all of which have been full of orders for many months past. It appears probable from the figures already published that the production of Germany, which was 7,215,927 tons in 1898, will be about 8,000,000 tons in 1899. Taking these three leading countries only, it would appear that the production has increased about 2,800,000 tons during the present year, but the consumption is still considerably ahead, as it has already absorbed all this, and reduced stocks throughout the world probably by 1,000,000 tons during the last 12 months. There is no evidence, therefore, that this increased production has reached the point which must affect prices when there is a surplus which has to be pressed for sale. To-day there is an urgent demand all round for pig iron, and it is understood that not only the production of this year, but also a good portion of the output of the first few months of 1900 has been sold already.

Considering the facts just stated, it is not surprising if we find a very smart advance in prices. Taking pig iron first, we find in this country an advance of about 25s. between the lowest and highest points of the year. In America the advance has been greater, say, $8 to $10. Manufactured iron and steel has risen 30s. to 40s. per ton. In America steel rails are $10, and steel billets $16 to $18 higher. Steel rails advanced about 35s. to 40s. in England.

The tin plate trade was affected not only by the improvement in iron, but also in tin, and in consequence it experienced an advance quite unprecedented. Since January 1 tin rose from £87 to £148 per ton, and this advance alone represented 1s. 6d. to 2s. 6d. increased cost per box. Considering the advance in iron it is not surprising to find that tin plates rose 5s. to 6s. per box, say, from 10s. to 10s. 6d. to 15s. and 15s. 6d., f.o.b., Wales. Although the Board of Trade returns do not show any increase in shipments of tin plates, the quantity of black plates (for tinning) shipped is constantly increasing, the figures for 1899 (eight months) being 20,000 tons in excess of 1898. The fact that there are now 390 mills at work, as against 290 mills same time last year, is proof that the volume of trade largely increased during the lest 12 months.

In considering the future prospects of the trade, there are several points which deserve consideration. It may be fairly anticipated that, with the profitable prices now ruling, every effort will be put forth to increase the production of pig iron; but it must be borne in mind that there are no inconsiderable difficulties in the way. In America it is feared that when winter comes on it will be found difficult to obtain the greatly increased quantity of ore necessary to keep all the present furnaces going, and it is already indicated that the cost of transport on Lake Superior may be considerably increased owing to the difficulty in procuring the additional tonnage which is required. In this country the reported increase of 350,000 tons for the first six months of this year is more apparent than real, as, owing to the strike in South Wales, there was a reduction of 150,000 tons in the production of 1898, as compared with 1897.

Owing to the great difficulty of getting an increased supply of coke, many furnaces are kept out of blast which otherwise might be working, and in July of the present year there were 404 furnaces in blast, as compared with 379 same time 1898—this is only equal to an increase of about 600,000 tons annually. Another factor which may affect the trade both of America and this country is the question of wages. There has already been some increase, but this is not at all proportioned to the advance in prices, and it is just possible there may be some difficulties with labor. Coal has advanced, but not at all as it did in former periods of activity in the iron trade, and higher prices are quite probable. Colliers are to receive an advance of 2½ per cent. this month, but it is highly probable that at the end of the year they will make a demand for at least a further 5 per cent. In this way the cost of production is gradually rising, and approximating to the higher prices now ruling.

It is assumed by many that the smart advance in prices must seriously affect the consumption of iron and steel, but there is so far but little evidence of this, as even shipbuilding orders, which were held back, are now being given out more freely. The experience of 1872-74 shows that after a time dealers being accustomed to the higher prices, and trade goes on pretty much as usual. The increasing use of iron and steel in many new forms, notably for structural purposes of all kinds, coupled with the expansion going forward in many countries, justifies us in expecting a continuance of active trade for a good while to come.

SPECIAL ENGLISH CORRESPONDENCE.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, Oct. 10, 1899.

New Lamps for Old Ones.—Control Up to the Burner.

The results of a fair practical trial of incandescent gas lighting, as conducted in many important towns last season, have proved so promising that an enormous extension of the system is now taking place. In some of our principal cities it has been adopted throughout, to the exclusion of all other methods of lighting, and it is scarcely too much to claim that the Welsbach is the light of the "present" so far as our streets and public thoroughfares are concerned. Last year it was very generally supposed, or assumed, that the Kern pattern of burner could not be successfully applied without the costly adjunct of a brand new lantern and the adoption of the system was consequently greatly hindered. Some people were glad of the excuse to get rid of a ramshackle good for-nothing lot of old lanterns that were a discredit to the town, and a great injustice to the gas company. But in places where the lanterns, though perhaps fairly worn, were still in good working condition, there was naturally an objection to throw away a serviceable set of apparatus in favor of a device that at that time, though apparently promising, was yet new and untried. Local authorities, as a rule, have more expenses on hand than they are able to meet, or in other words, the rates are kept down at the lowest possible figure. They have no spare funds to meet extraordinary expenses, such as a new set of lighting accessories, and the gas companies are not always in the position of the magician in "Aladdin," who was prepared to give a new lamp in exchange for an old one. Any gentleman who might be so disposed could get several thousands of old pattern street lanterns with the greatest ease. In some cases the gas companies have taken the matter up on even terms—the cost of the lighting to remain as before. That is a plan affording mutual advantages. The citizens get a better light, and the gas company look for a saving in consumption of gas, sufficient not only to meet the increased maintenance charges, but to work off, in the course of time, the first cost of the new appliances. But it is now known that any well constructed sound lantern can be adopted to take the Kern burner at a very moderate expense. The exact plan of procedure varies according to the construction of the lantern, but usually follows the line of closing up all bottom openings other than those necessary for the upright gas pipe and the chains or rods connected to the tap and fixing a cone or deflector in the top of the lantern in such a way as to induce inverted siphon ventilation. The air enters at the lower part of the top ventilator, passes down between the deflector and outside glass to the burner, ascends up the central part and escapes at the upper part of the ventilator. By this means a lamp can be converted, including cost of new burner and all accessories, at a cost of about 15s., and if even this outlay is an objection, arrangements can be made for covering it in the annual charge. Several firms are finding it worth while to make a special "line" of this kind of business. The marked development of incandescent street lighting has also directed the attention of inventors to the subject of self-acting igniters, and there is good reason to believe that the flash or pilot light will soon be a thing of the past. Some fairly satisfactory self igniters were put on the market last year, but great advances are now offered. Any gas company who treats this system with indifference is losing a valuable advertisement. Once put a well kept system of incandescent lights on the streets and the inhabitants will want them in their houses and shops also, and if the manager is as thoroughly in touch with his customers as he ought to be, it will not be long before some one comes into the office to ask if the gas company cannot take up the maintenance of his inside lights and give him a clean, neat, brilliant light, like that in the streets.

The introduction of the incandescent gaslight for ordinary private consumption is also making way. This appliance has been a useful aid towards the problem of how to obtain control of the gas up to the point of consumption, which has long been a vexed question. The average consumer persisted in using unsuitable or extravagant burners purchased from the nearest plumber or ironmonger, and if his bill was high he put it down to the rapacity of the gas company, while if the light was poor he blamed the quality of the gas. The company, as a rule, recognized the disadvantage under which they labored, but

scarcely knew how to remedy matters. Any suggestion offered by them was received with some suspicion, as likely to be an effort more in the direction of heaping up the bill than of assisting the consumer. Much has been done, in the way of prompt attention to complaints, to smooth the way. The letting of apparatus on hire was also a step in advance, as involving the fixing of the appliance and showing the customer how to use it. But the lighting appliances seemed to be a closed door. The gas manager had to stand by helplessly, and see his customer trying to light a room by means of dirty iron burners contained in shades having apertures barely 2 inches wide at the bottom and 12 inches, perhaps, at the top, giving a dim and jumping flame. Flat flame burners, such as Sugg's Christiania were by no means unknown, but many customers regarded the idea of paying anything over 5s. for a burner and shade as a senseless extravagance. Now they are beginning to see that the first cost of the appliance is not the primary consideration. They have tried the incandescent burner and perceived its merits, but have also found that some little intelligence and skill are necessary to keep it in proper order and condition, more perhaps than they are able or willing to afford. Then is the opportunity for the gas company to come to the rescue. If an experienced hand is sent in to clean and generally set the burners in order, the result is that the consumer at once owns that he does not want a better light, and is willing to agree to any reasonable terms for maintenance. The gas company, on the other hand, secure a good advertisement in every well kept installation, which acts as a valuable antidote to the cases of slovenly, incompetent, ill-kept gas lighting that are to be seen in every town. It would even be a wise policy to provide a few such advertisements entirely at their own expense, for the days when gas companies could afford to be indifferent as to the manner in which their specialty was before the public are a thing of the past. Every gas company who wishes to hold their own must take up the question of maintenance of incandescent lights at a fixed charge per quarter and perhaps the letting of the same on hire. It pays to let any appliances either for lighting, heating or cooking on hire, provided it will be regularly used. And there is no reason why they should not be as successful with gas lighting as they have been with gas cooking. Gas fires and other heating appliances are all very well and not to be despised. But it must not be overlooked that, while gas cookers and gas lights are used everyday, or at least several times in the week, the gas fire is not wanted at all for a large part of the year, and only intermittently during the remainder. The heating business is not so good a line as the lighting or cooking, for this reason. Once establish a good, regular business, and a certain amount of uncertain or chance trade can be dealt with. But the certain trade is the backbone, and the other, by itself, would scarcely be worth having. A 3-foot burner that will be used for 8,000 hours per annum, is a more profitable customer than a 30-foot gas fire, which will only be lit when the weather is cold.

As instancing the recognition of the above facts, reference may be made to the Bristol Gas Act passed this session, which, amongst other things, confers important powers with regard to meters and services. The meter is to be as near to the outside wall nearest the line of main as may be practicable, and is to be placed in such position as the company may reasonably prescribe. The company are not to require the alteration of existing meters at the expense of the consumer, except upon the occasion of a change of occupancy. The meter, together with all pipes and connections, is to be as far as practicable open to the inspection of the officers of the company. With regard to services on the consumers' premises, the company may call for the removal of pipes inferior in quality or size, badly laid or arranged, or not capable of furnishing a proper supply, and the substitution in their place of such pipes or fittings as may reasonably be prescribed, to be put down under the superintendence and to the satisfaction of the company. New services are to be of such material and workmanship as the company shall reasonably prescribe, laid under their superintendence and to their satisfaction. In default the company may discontinue or refuse to supply. If, however, the consumer is dissatisfied with the demands of the company, he can carry the case before two justices of the peace sitting in Petty Sessions, who shall settle any question of reasonableness.

These powers are a move in the right direction, but do not go far enough. How are the company, for instance, to determine whether the service or meter is of "sufficient size," unless they have powers to inspect the whole system up to each burner? Such inspection is also absolutely necessary before they can "prescribe" the proper size of meter or service to be put down. And a proper supply up to the meter is not of much use if the fittings beyond are of inferior arrangement, material or workmanship. An Englishman is fond of boasting that "his house is his castle." And he claims the right to waste his money and ruin his health in his castle if so inclined. As for the gas company wanting to know how many burners there are in the castle, that is nobody's business but his own. But there is now good reason for hoping that the average consumer is awakening to the fact that economy and efficsency in the use of gas cannot be secured without care and skill in the arrangement of the whole system from the companies' main to the burner. And that while the gas company, after all, are not unreasonable in asking that the gas shall be consumed with due care and avoidance of waste, or that they shall not be blamed if these conditions are not observed, it is also a matter affecting his comfort and his pocket, and greatly to his interest to avoid bad material, workmanship or design.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Mr. H. C. Bixby, Superintendent of the Urbana and Champaign (Ills.) Railway, Gas and Electric Company, in so far as its gas department is concerned, is a busy man these days overlooking and directing the betterments that the Company had arranged for last spring. The output of gas in the Urbana-Champaign district increases in a degree most satisfactory to those who are in control of the territory.

The Kerr-Murray Manufacturing Company, of Fort Wayne, Ind., is erecting a storage holder for the Trenton (Mo.) Gas Company.

The Trustees of the Wheeling (West Va.) City Gas Board have perfected the following organization, which control will exist for a period of two years: President, E. Buckman; Secretary, Godfrey Schul; Assistant Secretary, William Schenck; Superintendent, Frank Thompson; Collector, Louis Seabright.

At the annual meeting of the Troy (N. Y.) Gas Company the Trustees chosen were: A. Bleecker Banks, A. E. Bonesteel, Anthony N. Brady, Thomas Breslin, W. A. Thompson, R. G. Pruyn, Edward Murphy, Jr., F. J. Molloy, William Kemp, George P. Ide, S. O. Gleason, James Fleming and Fred. N. Draper.

A correspondent in Little Rock, Ark., writing under date of the 19th inst., says: "The following might do for our friend Shelton's Wrinkle department at the meeting of the Western Gas Association next May; but as that session seems a long way off you might spring it now on the boys, just to see whether any answers will be received between now and then, and I will forward the reply in due time. Here's the Wrinkle, "Why is W. J. Bryan like the disc of a standard bar photometer, located from the gas flame, 80 inches, and from the candle 20 inches?" Little Rock grows amazingly, and is now a handsome, bustling city. Since brother Dawes has taken hold of the gas helm business has increased rapidly. The works have been overhauled, and the additions to the plant include two new settings of 6's by the Parker Russell Company, of St. Louis, and a set of purifying boxes. Little Rock is surely in the gas swim.

Judge Dallas has issued a decree declaring that the Spring City Gas Company, of Royersford, Pa., is insolvent, and supplements the decree by ordering that the plant shall be sold to satisfy a mortgage. Under the circumstances one would think that something terrible had happened in connection with the Spring City plant, but the plain fact is the affair is underway simply to quiet a title.

The proprietors of the Peoples Gas Company, of Stoneham and Reading, Mass, have offered to sell their franchise and mains in the village of Reading to the local authorities for the sum of $9,000. This is the Company that formerly supplied gas to Wakefield, Mass., as well, but whose property in Wakefield has been, through purchase, for some time operated by the authorities of the place named for public account.

Another Gas Engine Company has been incorporated. It is the Lake Shore Gas Engine Company, of Marquette, Mich., and it is said to have been formed for the purpose of superseding the Lake Shore Iron Works, with the further idea of promoting the sale of what is known as the Lake Superior gas engine. The capitalization of the Company is put at $100,000, and its officers are: President, M. M. Haufman; Treasurer, Peter White; Secretary, K. E. Sherman.

The Directors of the Lowell (Mass.) Gas Light Company, who seem to have gotten beyond the point that made their Company years ago one of the solidest gas trading concerns in America, are responsible for the issuance of the following circular:

"To the stockholders of the Lowell Gas Light Company: Responsible bankers have made an offer of $400 in cash per share, or $2,000,000 in cash, for the entire 5,000 shares of the capital stock of the Lowell Gas Light Company. They have also made an alternative offer of $2,000,000 in cash for all the property and assets of the Company. Conferences have been held by your Directors with some of the largest stockholders, together representing a majority in the capital stock of the Company, and such stockholders have signified a desire to sell their stock for the above named price of $400 in cash per share; and your Directors being convinced that they have secured the highest offer possible for the property (to wit, a figure far in excess of any price for which the stock has ever been sold) have decided as individuals to sell on the above terms, and unanimously recommend similar action on the part of the stockholders. The above offer will remain open for the acceptance of the stockholders, until Saturday, the 11th day of November, 1899; and will you, therefore, kindly sign the inclosed option and proxy, if you desire to sell, returning same, in stamped envelope herewith, at your earliest convenience."

THE advice and council hereinbefore detailed are signed by the seven Directors of the Company, who have directed its affairs for many years, but who seem to have grown gray in their calling. The "responsible bankers" who have made the offer of $400 per share for the Lowell Company's stock must have smiled inwardly when they noted, in the Directors' recommendation to the shareholders to sell, that a stamped envelope had been forwarded the latter, so that there would be no further cost to them in parting with their property. Meanwhile it is fair to presume that the "expense account" of the Lowell Gas Light Company paid for the stamped envelopes. From our knowledge of the proposed bargain as it stands, many of the "small" shareholders in the Company will decline to part with their stock at $400 per.

THE Welsbach Street Lighting Company, of America, through its Chicago Agent (Mr. E. H. Hoagland) seems to have convinced the authorities of Belvidere, Ills., that there is more than a little in the idea that gas is a pretty good thing for the illumination of the streets, even in competition with electric lights. Mr. T. E. Bates, who is the Manager of the Belvidere Gas Light and Fuel Company, reports that gas very much more than holds its own in his bailiwick.

THE American Thread Company, of Holyoke, Mass., has placed the order for its new boiler house with the Berlin Iron Bridge Company, of East Berlin, Conn.

IN connection with the recent change in ownership of the Gas Light Company of the City of New Brunswick, N. J., a correspondent informs us that residents of Newark, N. J., are in complete control. He further adds that New Brunswick investors are also interested, and that these officers will direct the Company's management: President, J. Bayard Kirkpatrick; Treasurer, Lafferd Totten; Secretary, John C. Eisele. The Company will reconstruct its plant next season.

A CORRESPONDENT in Providence, R. I., forwards the following narrative, which appeared in the columns of the Boston *Advertiser*, dated the 21st inst.: "Lucien Sharpe died on board the steamer Saale, while voyaging between Europe and America, on the afternoon of the 17th inst. Deceased who was born in Providence, R. I., March 20, 1830, inherited the business instincts of his father. He served a 5 years' apprenticeship with a local concern, known as J. R. Brown & Co., who were engaged in the manufacture of special small castings. In 1853 he was admitted to a membership in the firm of J. R. Brown and Sharpe, and five years' thereafter the concern was authorized by the Wilcox & Gibbs Sewing Machine Company to manufacture all its machines. For many years he was a Director in the Wilcox & Gibbs Sewing Machine Company, of New York. In 1881 he was elected a Trustee of the Providence Institution for Savings, and subsequently was named its Vice President. He was officially connected with the National Bank of North America, with the Rhode Island Hospital Trust Company, and with the Union Railroad Company. In 1883 he was chosen a Director in the Providence Gas Company, which benefited much from his sturdiness. In 1892 Brown University conferred upon him the degree of A.M. He was much liked by his intimates."

A CERTIFICATE has been filed announcing an increase in the capital stock of the St. Thomas (Can.) Gas Company, from $60,000 to $100,000.

MR. GEORGE F. BLAKE, of Boston, Mass., has been elected President of the Easton (Pa.) Gas Company, vice Mr. M. H. Jones, resigned.

THE proprietors of the San Jose (Cal.) Light and Power Company find that their new net rate of $1.75 per 1,000 cubic feet meets with much favor with the residents. If Mr. Quilty's advice had been followed some time ago the current favor would be an old story.

"UNOFFICIALLY," we are advised that the ordinary shareholdings of the again changed Buffalo (N. Y.) Gas Company will amount to $9,000,000, divided into $2,000,000, non-cummlative, 6 per cent. preferred shares, and $7,000,000 of common. The extraordinary capitalization may be said to comprise $7,000,000 of 5 per cent. interest bearing bonds. The latter are of the guaranteed, gold class.

COLUMBUS, Ga., seems disposed to try Welsbach lamps for the illumination of its streets. The proposed price is $31 per lamp per annum, the Company to furnish the posts. If the city furnishes the equipment of post and lantern the rate for the gas service is to be $21 per annum.

A RATHER scaly looking enterprise in the opposition line is reported as again projected for Pottsville, Pa., where Messrs. John N. Minds, H. N. Woolman, William E. Chapman, Albert T. Bauer and F. E. Swope have applied for a charter to operate the Peoples Gas Company. Pottsville may need a better system for the draining of its residences, but the existing Gas Company is quite up to the lighting requirements of the place that are in its line. The Pottsville instance cited is nothing more or less than a strike.

WORK on the plant of the Athens and Sayre (Pa.) gas plant is well along to completion. Mr. Fritchman and partner Decker made no mistake when they determined that the places named needed more light.

DOVER, N. J., is also a locality that could stand quite some relief from the hands of the electricians who are in control of its public and private illumination.

THE Market street plant of the old Philadelphia Gas Trust, save for its holders, will soon be a thing of the past. Its dismantling, in fact, may occupy some months, but the work of dismemberment is underway.

SUPERINTENDENT KNAPP of the Augusta (Ga.) Company, is much elated over the demands of the residents for services on account of the use of gas for fuel purposes. His work on mainlaying, which had principally to do with extensions into new districts, has been held back through the inability of the contractors to make pipe deliveries.

THE Berlin Iron Bridge Company, of East Berlin, Conn., is shipping to Mexico the structural iron material for a roof for a building which is to be 80 feet wide and 255 feet long. The roof is to be erected on masonry walls, and the buildings when finished will be occupied by the San Raphael Paper Company. It is a duplicate of work furnished the same concern something over a year ago.

SOME time age we noted that the Hamilton (Can.) Gas Company had decided to reduce its selling rate. The official notification of the concession is couched in these words: "On first November next customers of the gas company will be charged for lighting and fuel gas $1.50 per 1,000 feet, and if the same is paid at the office of the Company within 14 days after account is due, a reduction of 50 cents per 1,000 feet will be made, making the net price $1 per 1,000 feet.—Edmund Cathel's, Supt.." Mr. Cathel's proposes to be in the market for main pipe next spring.

Electrolysis.

Engineering Record says that among the papers presented at the recent convention of the American Society of Municipal Improvements was one on electrolysis from the standpoint of the municipal electrician, by Mr. H. S. Wynkoop, electrical engineer of the department of buildings, lighting and supplies of the Borough of Brooklyn, N. Y. In Brooklyn there are about 600 miles of street railway track, 6 railway power houses well distributed and a daily average of about 1,900 cars in operation. Underground are the gas and water mains, Edison tubes, cement-lined iron subway ducts, earthenware subways containing lead-covered cables, supplementary wires and bundles of old rails used as ground returns. In addition, the structure of the elevated railway is being made the equivalent of a ground return through its bond connections with the tracks it supports. All of these conductors are

(*Continued on page* 698.)

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
EDITORS.

CHAS. E. SANDERSON,
MANAGER.

MONDAY, OCT. 30, 1899.

(*Continued from page* 697.)

jumbled together, forming an irregular network through which the stray electricity is dodging hither and thither. To increase the complications, intentional connections between dissimilar conductors have been made from time to time at the instance of experts retained by one or another of the corporations.

In earlier days the most generally accepted method of dealing with electrolysis involved the attaching of a bond wire to the damaged spot in order to conduct away harmlessly the electricity that was causing the trouble. By means of these bonds the various corporations are caring, in specific instances, for stray currents in amounts varying from 20 to 80 amperes. Each corporation has its own expert watching developments and applies its own remedies regardless of the effect on its neighbors or the disturbance of the electrical equilibrium thus occasioned.

The water department in Brooklyn since 1896 has simply been awaiting developments. In that year tests were made which gave indications that the cast iron mains were reasonably safe. Careful examination was made of the pipes at so called danger points, but no evidence of electrolysis was found. Neither has any damage occurred to the cast iron gas mains, but the wrought iron and steel service pipes have been attacked. Telephone cables appear to be reasonably safe, but the electric light cables are in an unsatisfactory condition. Edison tube is suffering greatly in some places and the cast iron coupling boxes have also been attacked. The experience of other cities is similar to that of Brooklyn and the subject is almost invariably treated from one point of view as in its relation to the gas system, water pipes, cable coverings or the street railway.

Mr. Wynkoop considers the municipality responsible for the existence of the problem and for the securing of its solution for the following reasons: It originally approved, by franchise, of the overhead trolley; the public interests are jeopardized and the protection of such interests is a function of the municipality; it is generally the only body exercising authority over all of the private corporations operating within its boundaries. But in spite of its responsibility the municipality is doing practically nothing to solve the problem. As a remedy Mr. Wynkoop suggests a commission of nine members representing the various interests concerned in the problem and the electrical bureau of the city if there be one. A lawyer and a chemist should also be on the commission, the latter because Mr. Wynkoop considers that chemistry is to play a large part in the solution of the problem.

In conclusion Mr. Wynkoop states that "electrical remedies have thus far failed. The improved track return is a palliative, not a cure. The inter bonding plan results in a ceaseless disturbance of the electrical equilibrium. The auxiliary potential method is applicable only to those towns whose electrical map is comparatively simple and few of the larger towns come within this class to-day. The insertion of insulating sections of pipe along the line tends to throw an increased burden upon other conductors. Finally, not one of these suggested remedies offers more than a partial and temporary relief. All of them de-localize and render latent the evidences of electrolytic decay; but to just what extent is a hard matter to determine. Voltmeter readings are undeniably valuable; and yet, after all, they are merely resultants, so that, when accepted in their true light, they afford no absolute certainty that local action is not taking place in the immediate vicinity of the test points."

Rolling Large Seamless Pipe.

Iron Age says a highly interesting product, from the standpoint of its promise for the future, is now at the works of the well-known firm of machinery builders, the Philadelphia Roll and Machine Company. It is a piece of seamless steel pipe in the rough, as it came from the rolls, its inside diameter being 20 inches, while the thickness of the walls is ⅝-inch. Its length is 72 inches, that being the maximum, due to the size of the heating furnace. It was rolled at South Bethlehem, at the experimental plant built there some time since to produce from hollow ingots, direct, steel pipe of large diameters. The mill was built under the patents of S. P. M. Tasker, now controlled by W. F. Bartlett, 1818 North 18th street, Philadelphia. Mr. Bartlett modified the original design and a few weeks since succeeded in rolling the pipe referred to. At the present time some improvements are being added to the mill, and then, it is expected, a further and final trial will be made. The test made shows that pipe of large diameter can be rolled from the hollow ingot and it is believed that the method will develop a large and profitable industry.

The Market for Gas Securities.

The city gas share market was dull, strong and expectant during the week. We say expectant, because the large and small fry in that gas swim seemingly agreed that portents were in the financial ebbs and flows. It was presumed that the last Friday in October would be marked by a mild breeze from the direction of Irving place, but it is now 3:30 P.M. of the very Friday, and even the leaves have not rustled. Consolidated opened to-day at 188¼ to 189¼, and the closing was the same. Standards, particularly in the instance of the preferred, were in some request. Amsterdams, of all sorts, were featureless, as far as changes in the pegging board went.

Brooklyn Union, on a moderate inquiry for real transactions, moved up sharply from the figures of last week quite 5 points. Detroit gas has crossed the par mark, and its shareholders are to receive a dividend of 2½ per cent., payable the 15th prox. Peoples, of Chicago, is advancing nearer to its true value. To-day the opening was made at 114 to 114¼. It is cheap. Bay State is 1¼ to 1⅝. Laclede sold above 80 and subsequently broke sharply. To-day it is 76 to 76¼. Some improvement has occurred in Syracuse gas, which is quoted at 16 to 17½. Baltimore Consolidated is 62 to 63. The general market is strong.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

OCT. 30.

☞ All communications will receive particular attention

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$39,078,000	100	188¼	189¼
Central Union, Bonds, 5's.	3,000,000	1,000	107½	108½
Equitable Bonds, 6's	1,000,000	1,000	105	..
" 1st Con. 5's	2,300,000	1,000	115	118
Metropolitan Bonds	658,000	.	108	112
Mutual	3,500,000	100	273	300
" Bonds	1,500,000	1,000	100	102
Municipal Bonds	750,000	.	..	
New Amsterdam Gas Co.	13,000,000	100	29½	30
Preferred	10,000,000	100	55½	56½
Bonds, 5's	11,000,000	1,000	96⅞	97
Northern Union, Bonds, 5's.	1,250,000	1,000	95	97
New York and East River..				
Bonds 1st 5's	3,500,000	1,000	109	111
" 1st Con. 5's	1,500,000	..	112	114
Richmond Co., S. I.	348,650	50	70	..
" Bonds	100,000	1,000	..	..
Standard	5,000,000	100	110	120
Preferred	5,000,000	100	140	150
Bonds, 1st Mortgage, 5's	1,500,000	1,000	112	114
Yonkers	299,65	500	130	..
Out-of-Town Companies.				
Brooklyn Union	15,000,000	100	143	144
" " Bonds (5's)	15 000,000	1,000	118	119
Bay State	50,000,000	50	1½	1⅝
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works	450,000	100	40	..
" 1st Mtg. 5's	450,000	1,000	95	98
Boston United Gas Co.—				
1s Series S. F. Trust	7,000,000	1,000	92	..
2d " " "	3,000,000	1,000	68	71
Buffalo City Gas Co.	5,500,000	100	8	9½
" " Bonds, 5's	5,250,000	1,000	84	85
Central, San Francisco	2,000,000	..	105	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	104¼
Columbus	1,144,700	100	70	75
1st Mortgage	1,207,000	1,000	106	108
Consumers. Jersey City	2,000,000	100	100	..
" Bonds	600,090	1,000	107½	110
Cincinnati G. & C. Co.	8,500,000	100	193¾	194
Consumers, Toronto	1,700,000	50	230	235
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Consolidated, Baltimore	11,000,000	100	62	63
Mortgage, 6's	3,600,000	..	..	118
Chesapeake, 1st 6's.	1,000,000	..	..	..
Equitable, 1st 6's.	910,000	..	..	..
Consolidated, 1st 5's	1,490 000	..	..	112
Consolidated Gas Co. of N.J.	1,000,000	100	21	23
" Con. Mtg. 5's	880,000	1,000	87	90
Consolidated G. & E. Co.'s., Little Falls, N.Y.	90,000	100	..	100
Bonds	75,000	..	..	100
Detroit City Gas Co	4,560,000	50	100	101
" Prior Lien 5's	4,546,000	1,000	94¼	94½
Detroit Gas Co., 5's	423,000	1,000	100	101
" Inc. 5's	31,000	100	100½	101
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	..	101
Fort Wayne	2,000,000	..	77	83
" Bonds	2,000,000	..	80	85
Grand Rapids Gas Lt. Co.	1,000,000	50	..	..
" 1st Mtg. 5's	1,125,000	1,000	..	..
Hartford	750,000	25	..	220
Indianapolis	2,000,000	..	122	128
" Bonds, 6's	2 650,000	..	105	106
Jackson Gas Co	250,000	50	50	..
" 1st Mtg. 5's	250,000	1,000	96	100
Jersey City	750,000	20	225	275
Lafayette Gas Co., Ind.	1,000,000	100	68	70
Bonds	1,000,000	1,000	81	86
Louisville	3,570,000	50	106	108
Laclede, St. Louis	7,500,000	100	76	76¼
Preferred	2,500,000	100	102	103
Bonds	10,000,000	1,000	107	108
Madison Gas & Elec. Co.	400,000	100	82	85
" 1st Mtg. 6's	350,000	1,000	102	..

Montreal, Canada	2,000,000	100	200	..
Newark, N. J., Gas Co	16,000,000	..	50	60
Bonds, 6's	4,600,000	..	107	108
New Haven	1,000,000	25	280	300
Nashville Gas Lt. Co	1,000,000	50	110	..
Oakland, Cal	2,000,000	..	53½	55
" Bonds	750,000	..	..	..
Peoples G. L. & Coke Co., of Chicago	25,000,000	100	114	114½
Peoples Gas Lt. & Coke Co., Chicago, 1st Mortgage	20,100,000	1,000	111½	112
2d "	2,500,000	1,000	104	105
Peoples, Jersey City	500,000	50	215	..
Rochester Gas & Elec. Co	2,150,000	50	88	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	87½	90
San Francisco, Cal.	10,000,000	100	70	73
St. Paul Gas Light Co	1,500,000	100	50	52
1st Mortgage 6's	650,000	1,000	82	85
Extension, 6's	600,000	1,000	..	..
General Mortgage, 5's	2,428,000	1,000	80	82
St. Joseph Gas Co	1,000,000	100	42	44
" 1st Mtg. 5's	750,000	1,000	96	99
Syracuse, N. Y.	1,750,000	100	16	17½
Bonds	1,612 000	1,000	81	84
Washington, D. C	2,600,000	20	280	..
First mortgage 6's	600,000	..	..	..
Western, Milwaukee	4,000,000	100	99	100
Bonds, 5's	3,830,500	.	106	108
Wilmington, Del.	600,000		230	250

Advertisers' Index.

GAS ENGINEERS.

Page

Wm. Henry White, New York City ... 719
Fred. Bredel, Milwaukee, Wis ... 706
Geo. R. Rowland, New York City ... 703
The Western Gas Construction Co., Fort Wayne, Ind ... 684
Humphreys & Glasgow, New York City ... 704
American Gas Co., Phila., Pa ... 706
David Leavitt Hough, New York City ... 716
Economical Gas Apparatus Construct'n Co., Toronto, Ont. 703
Baxter & Young, Detroit, Mich ... 716
United Gas Improvement Co., Phila., Pa ... 711
James T. Lynn, Detroit, Mich ... 716
A. E. Boardman, Brevard, N. C ... 716
Gilbert & Barker Mfg. Co., New York City ... 702

GAS WORKS APPARATUS AND CONSTRUCTION.

James R. Floyd's Sons, New York City ... 720
Continental Iron Works, Brooklyn, N. Y ... 718
Deily & Fowler, Phila., Pa ... 720
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 716
Stacey Mfg. Co., Cincinnati, Ohio ... 719
Bartlett, Hayward & Co., Baltimore, Md ... 717
Davis and Farnum Mfg. Co., Waltham, Mass ... 716
R. D. Wood & Co., Phila., Pa ... 718
Isbell-Porter Company, New York City ... 718
Fred. Bredel, Milwaukee, Wis ... 706
United Gas Improvement Co., Phila., Pa ... 711
National Gas and Water Co., Chicago, Ills ... 713
Economical Gas Apparatus Construct'n Co., Toronto, Ont. 703
The Western Gas Construction Co., Fort Wayne, Ind ... 684
Humphreys & Glasgow, New York City ... 704
American Gas Co., Phila., Pa ... 706
Logan Iron Works, Brooklyn, N. Y ... 720
Riter-Conley Mfg. Co., Pittsburgh, Pa ... 719
Baxter & Young, Detroit, Mich ... 716
Berlin Iron Bridge Co., East Berlin, Conn ... 705
G. Shepard Page's Sons, New York City ... 716
James T. Lynn, Detroit, Mich ... 716
A. E. Boardman, Brevard, N. C ... 716
Gilbert & Barker Mfg. Co., New York City ... 702
Sutherland Construction & Improvement Co., N.Y. City 702

PROCESSES.

Bartlett, Hayward & Co., Baltimore, Md ... 717
United Gas Improvement Co., Phila., Pa ... 711
Burdett Loomis, Hartford, Conn ... 718
National Gas and Water Co., Chicago, Ills ... 713
Economical Gas Apparatus Construct'n Co., Toronto, Ont. 703
The Western Gas Construction Co., Fort Wayne, Ind ... 684
Humphreys & Glasgow, New York City ... 704
Gilbert & Barker Mfg. Co., New York City ... 702
Sutherland Construction & Improvement Co., N.Y. City 702
B. E. Chollar, St. Louis, Mo ... 700

SCRUBBERS AND CONDENSERS.

R. D. Wood & Co., Phila., Pa ... 718
James R. Floyd's Sons, New York City ... 720
Continental Iron Works, Brooklyn, N. Y ... 718
Logan Iron Works, Brooklyn, N. Y ... 720
Riter-Conley Mfg. Co., Pittsburgh, Pa ... 719

TAR AND CARBONIC ACID EXTRACTOR.

R. D. Wood & Co., Phila., Pa ... 718

AMMONIA CONCENTRATORS.

Michigan Ammonia Works, Detroit, Mich ... 700
American Gas Company, Phila., Pa ... 706

GAS METERS.

John J. Griffin & Co., Phila., Pa ... 724
American Meter Co., New York and Philadelphia ... 723
Helme & McIlhenny, Phila., Pa ... 723
D. McDonald & Co., Albany, N.Y ... 721
Nathaniel Tufts Meter Co., Boston, Mass ... 722
Maryland Meter and Mfg. Co., Baltimore, Md ... 722
Metric Metal Co., Erie, Pa ... 723
Keystone Meter Co., Royersford, Pa ... 722
Detroit Meter Company, Detroit, Mich ... 683

PREPAYMENT METERS.

American Meter Co., New York and Philadelphia ... 723
John J. Griffin & Co., Phila., Pa ... 724
D. McDonald & Co., Albany, N. Y ... 721
Helme & McIlhenny, Phila., Pa ... 723
Nathaniel Tufts Meter Co., Boston, Mass ... 722

GAS AND WATER PIPES.

M. J. Drummond & Co., New York City ... 721
R. D. Wood & Co., Phila., Pa ... 718
Warren Foundry and Machine Co., New York City ... 721
Donaldson Iron Co., Emaus, Pa ... 721

PIPE CUTTERS.

The Anderson Pipe Cutter Co., East Boston, Mass ... 703

GAS MAIN STOPPERS.

Safety Gas Main Stopper Co., N. Y. City ... 702

FLEXIBLE JOINTS.

Campbell Mfg. Co., Stamford, Conn ... 700

STEAM BLOWER FOR BURNING BREEZE.

H. E. Parson, Brooklyn, N. Y ... 718

GAS COALS.

Penn Gas Coal Co., Phila., Pa ... 715
Perkins & Co., New York City ... 714
Despard Gas Coal Co., Baltimore, Md ... 715
Westmoreland Coal Co., Phila., Pa ... 715
Berwind-White Coal Mining Co., New York and Phila ... 714

CANNEL COALS.

Perkins & Co., New York City ... 714

CONVEYORS.

The Link-Belt Machinery Co., Chicago, Ills ... 702

GAS ENRICHERS.

Standard Oil Co., New York City ... 715
The Sun Oil Co., Pittsburgh, Pa ... 715

COKE CRUSHER.

C. M. Keller, Columbus, Ind ... 715

GAS GAUGES.

The Bristol Co., Waterbury, Conn ... 704

GAS GOVERNORS.

Connelly Iron Sponge and Governor Co., New York City 713
Isbell-Porter Co., New York City ... 718
R. D. Wood & Co., Phila., Pa ... 718
Wm. M. Crane Co., New York City ... 701

CEMENTS.

C. L. Gerould, Galesburg, Ills ... 712

RETORTS AND FIREBRICKS.

J. H. Gautier & Co., Jersey City, N. J ... 712
Adam Weber, New York City ... 712
Laclede Firebrick Mfg. Co., St. Louis, Mo ... 712
Cyrus Borgner, Phila., Pa ... 712
James Gardner, Jr., Pittsburgh, Pa ... 712
Henry Maurer & Son, New York City ... 772
Baltimore Retort and Firebrick Co., Baltimore, Md ... 712
Parker-Russell Mining and Mfg. Co., St. Louis, Mo ... 712
Brooklyn Firebrick Works, Brooklyn, N. Y ... 712

REGENERATIVE FURNACES.

Bartlett, Hayward & Co., Baltimore, Md ... 717
Fred. Bredel, Milwaukee, Wis ... 706
J. H. Gautier & Co., Jersey City, N. J ... 712
Parker-Russell Mining and Mfg. Co., St. Louis, Mo ... 712
Adam Weber, New York City ... 712

SELF-SEALING MOUTHPIECE DOORS.

Isbell-Porter Co., New York City ... 718
Continental Iron Works, Brooklyn, N.Y ... 718
Logan Iron Works, Brooklyn, N. Y ... 720
R. D. Wood & Co., Phila., Pa ... 718

INCANDESCENT GAS LAMPS.

Welsbach Commercial Co., Phila., Pa ... 710

BURNERS.

C. A. Gefrorer, Phila., Pa ... 718
Wm. M. Crane Co., New York City ... 703
D. M. Steward Mfg. Co., Chattanooga, Tenn ... 703

LAVA GAS TIPS.

D. M. Steward Mfg. Co., Chattanooga, Tenn ... 703

STREET LAMPS.

Welsbach Street Lighting Co., New York and Phila ... 708
Thos. T. W. Miner, New York City ... 700

PURIFIERS.

Stacey Mfg. Co., Cincinnati, O ... 700

PURIFYING MATERIALS.

Connelly Iron Sponge and Governor Co., New York City 713
van Baarda & Co., Dusseldorf-on-the-Rhine ... 713

VALVES.

Ludlow Valve Manufacturing Co., Troy, N. Y ... 704
Chapman Valve Manufacturing Co., Boston, Mass ... 704
R. D. Wood & Co., Phila., Pa ... 718
Continental Iron Works, Brooklyn, N. Y ... 718
The P. H. & F. M. Roots Co., Connersville, Ind ... 707
Isbell-Porter Co., New York City ... 718
The Western Gas Construction Co., Fort Wayne Ind ... 684

EXHAUSTERS.

The P. H. & F. M. Roots Co., Connersville, Ind ... 707
Isbell-Porter Company, New York City ... 718
Connelly Iron Sponge and Governor Co., New York City 713

ELECTRICAL APPARATUS.

Wm. Henry White, New York City ... 719

ENGINES AND BOILERS.

The Hazelton Boiler Company, New York City ... 700

PURIFIER SCREENS.

John Cabot, New York City ... 704

GAS STOVES.

American Meter Co., New York and Philadelphia ... 709
Maryland Meter and Manufacturing Co., Baltimore, Md. 722
Keystone Meter Co., Royersford, Pa ... 722
Wm. M. Crane Co., New York City ... 701
Nathaniel Tufts Meter Co., Boston, Mass ... 722
Gilbert & Barker Mfg. Co., New York City ... 702

HOT WATER HEATERS.

Wm. M. Crane Co., New York City ... 701
Gilbert & Barker Mfg. Co, New York City ... 702

GASHOLDER TANKS.

J. P. Whittier, Brooklyn, N. Y ... 704

GASHOLDERS.

Bartlett, Hayward & Co., Baltimore, Md ... 717
Continental Iron Works, Brooklyn, N. Y ... 718
Deily & Fowler, Philadelphia, Pa ... 720
Davis & Farnum Mfg. Co., Waltham, Mass ... 716
Kerr Murray Mfg. Co., Fort Wayne, Ind ... 716
Stacey Mfg. Co., Cincinnati, Ohio ... 719
R. D. Wood & Co., Philadelphia, Pa ... 718
Logan Iron Works, Brooklyn, N. Y ... 720
Riter-Conley Mfg. Co., Pittsburgh, Pa ... 719

GAS SECURITIES.

Henry Marquand & Co., New York City ... 700

PATENTS.

H. S. Thornberry, Washington, D. C ... 721

ADVERTISING.

J. Howland Harding, New York City ... 700

BOOKS, ETC.

Newbigging's Handbook ... 708
Field's Analysis, 1898 ... 705
Scientific Books ... 714
Digest of Gas Cases ... 715
Practical Photometry ... 712
Gas Flow Computers ... 715
Hughes' "Gas Works" ... 713
Gas Engineer's Pocket-Book ... 704
Excerpts from Reports of Gas Commissioners ... 717
Poole on Fuels ... 723
Binders ... 721
Directory of Gas Companies ... 719
Practical Handbook on Gas Engines ... 708
Coal Tar Tree ... 704

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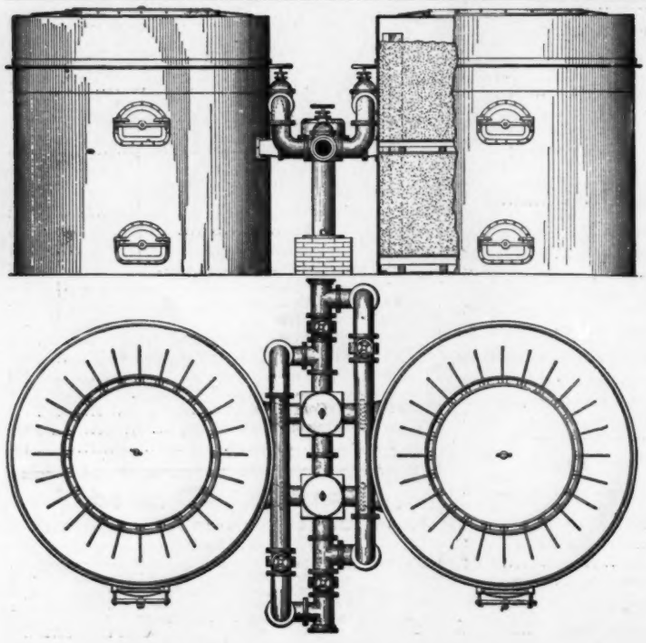

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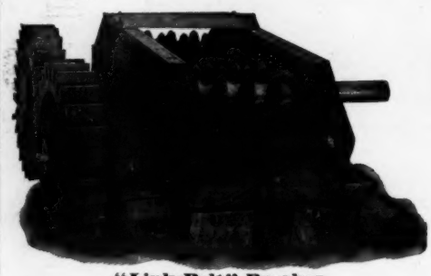

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Saltley Works, Birmingham, Eng.	2,000,000	Peterborough, Ont.	250,000
Colchester, Eng.	300,000	Wilkesbarre, Pa.	750,000
Birkenhead, Eng.	2,250,000	St. Catherine's (Second Contract),	250,000
Swindon (New Swindon Gas Co.), Eng.	120,000	Buffalo, N. Y.	2,000,000
Saltley Works, Birmingham, Eng. (2d Contract)	2,000,000	Winnipeg, Man.	500,000
Windsor St. W'ks, Birming'm, Eng. (2d Contract)	2,000,000	Colchester, Eng. (Second Contract),	300,000
Halifax, Eng.	1,000,000	York, Eng.	750,000
Toronto,	250,000	Rochester, Eng.	500,000
Ottawa,	250,000	Kingston, Ont.	300,000
Toronto (Second Contract, Remodeled),	2,000,000	Crystal Palace District, Eng.	2,000,000
Lindsay (Remodeled),	125,000	Duluth, Minn.	300,000
Belleville,	250,000	Caterham, Eng.	150,000
Ottawa (Second Contract),	250,000	Enschede, Holland,	150,000
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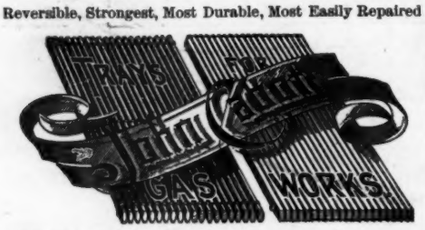

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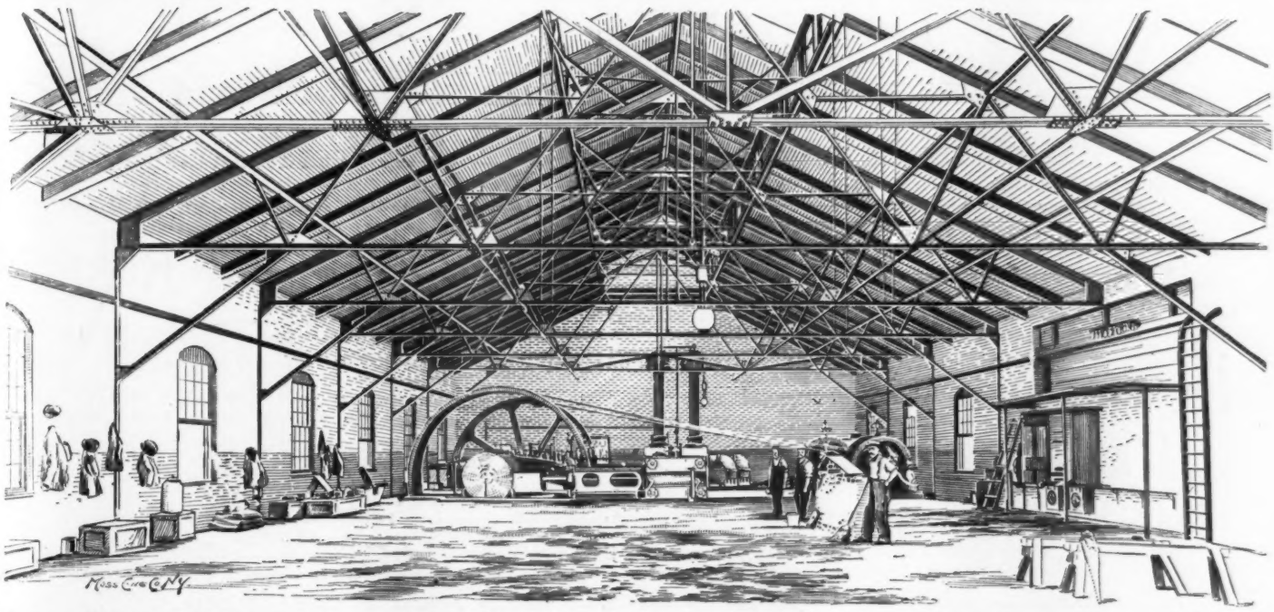

The above illustration is taken direct from a photograph and shows the interior of an Engine Room or Power House, which was designed and built by us for the Scranton Traction Company, at Scranton, Pa. The building is 60 feet wide and 120 feet long, the framework being entirely of steel. Between the steel sideposts is placed a light brick wall to protect the interior from the weather, and ventilation is secured by a monitor the full length of the building, with swinging sash on the sides. The roof is covered with slate secured to the roof plank.

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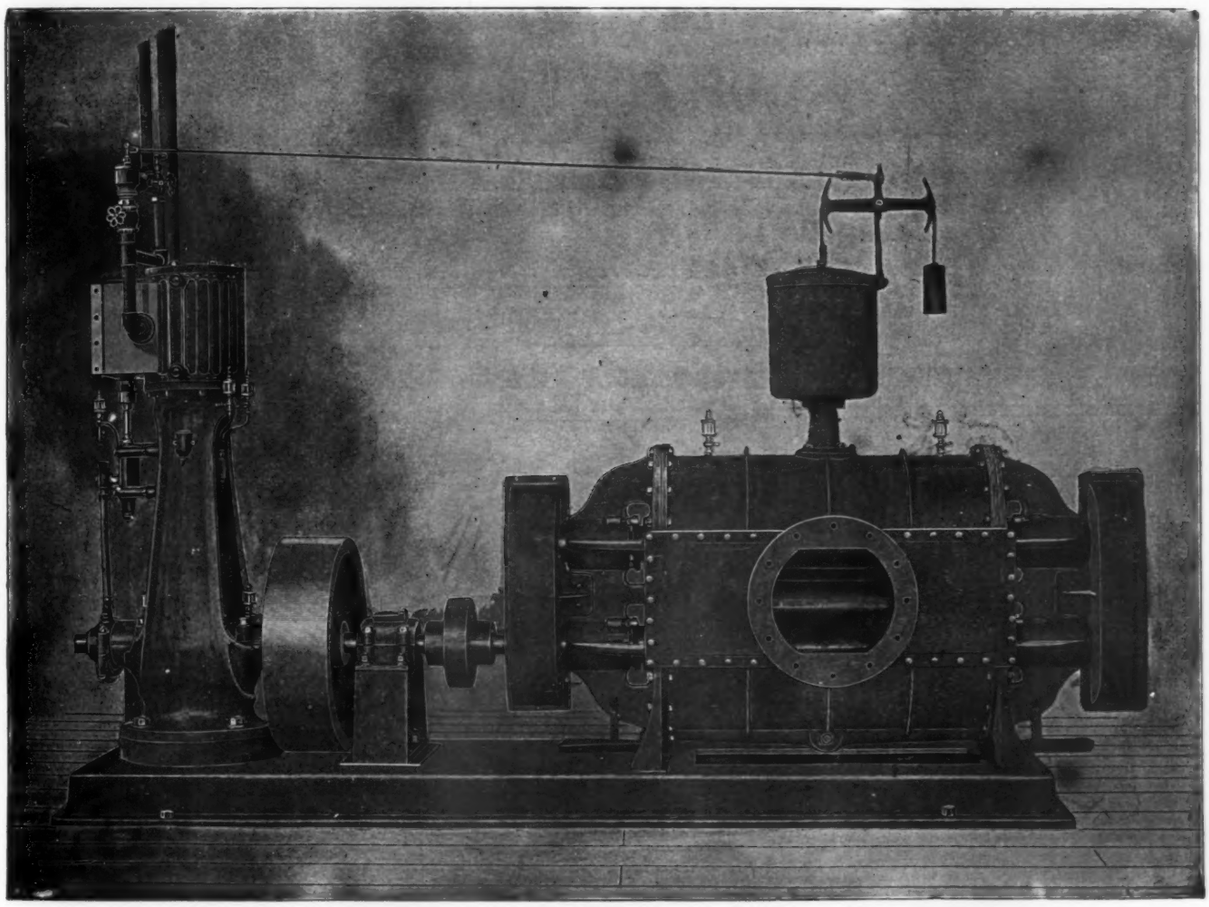

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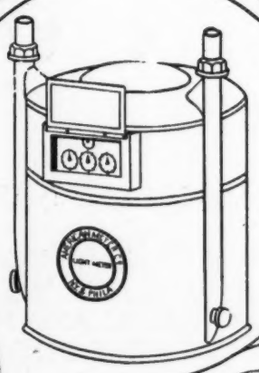

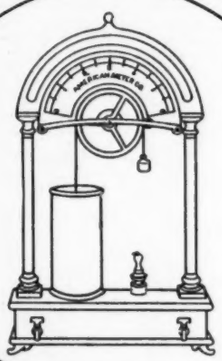

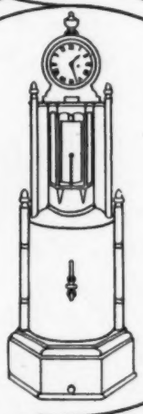

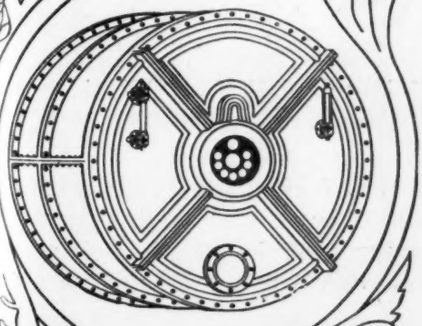

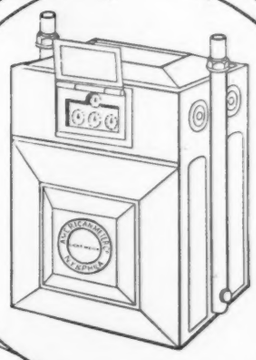

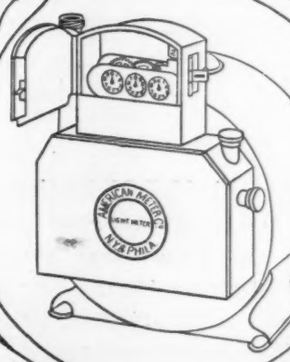

PUBLIC LIGHTING TABLE.

NOVEMBER, 1899.

Day of Week.	Date.	Table No. 1. Following the Moon. Light.	Table No. 1. Following the Moon. Extingnish.	Table No. 2. New York City. All Night Lighting. Light.	Table No. 2. New York City. All Night Lighting. Extinguish.
				P.M.	A.M.
Wed.	1	5.30 PM	5.30 AM	4.45	5.35
Thu.	2	5.30 NM	5.30	4.45	5.35
Fri.	3	5.30	5.30	4.45	5.35
Sat.	4	5.30	5.30	4.45	5.35
Sun.	5	5.20	5.40	4.40	5.45
Mon.	6	5.20	5.40	4.40	5.45
Tue.	7	7.30	5.40	4.40	5.45
Wed.	8	8.40	5.40	4.40	5.45
Thu.	9	9.50	5.40	4.40	5 45
Fri.	10	11.00 FQ	5.40	4.40	5.45
Sat.	11	12.10 AM	5.40	4.40	5.45
Sun.	12	1.20	5 40	4.30	6.00
Mon.	13	2.30	5.40	4.30	6.00
Tue.	14	3.40	5.40	4 30	6.00
Wed.	15	No L.	No L.	4.30	6.00
Thu.	16	No L. FM	No L.	4.30	6.00
Fri.	17	No L.	No L.	4.30	6.00
Sat.	18	5.10 PM	6.40 PM	4 30	6.00
Sun.	19	5.10	7.40	4.25	6.00
Mon.	20	5.10	8.30	4 25	6.00
Tue.	21	5.10	9.30	4.25	6.00
Wed.	22	5.10	10.30	4.25	6.00
Thu.	23	5.10	11.30	4.25	6.00
Fri.	24	5.10 LQ	12.30 AM	4.25	6.00
Sat.	25	5.10	1.30	4.25	6.00
Sun.	26	5.10	2.30	4.20	6.10
Mon.	27	5.10	3.30	4.20	6.10
Tue.	28	5.10	4.30	4.20	6.10
Wed.	29	5.10	6.00	4.20	6.10
Thu.	30	5.10	6.00	4.20	6.10

TOTAL HOURS LIGHTING DURING 1899.

By Table No. 1.	Hrs. Min.	By Table No. 2.	Hrs. Min.
January	215.40	January	423.20
February	184.40	February	355.25
March	187.40	March	355.35
April	166.50	April	298.50
May	158.00	May	264.50
June	140.50	June	234.25
July	150.30	July	243.45
August	168.30	August	280.25
September	179.50	September	321.15
October	213.20	October	374.30
November	217.00	November	401.40
December	238.10	December	433.45
Total, yr.	2221.00	Total, yr.	3987.45

OFFICE OF THE

Welsbach Light Co.,

BROAD AND ARCH STREETS,

PHILADELPHIA, PA., June 23, 1899.

To the Stockholders of the Welsbach Light Company:

In answer to the many inquiries received from the stockholders as to whether the Welsbach Light Company is interested in the Kern Light or the Kern Incandescent Gas Light Company, I am authorized by the Board of Directors of this Company to advise you that **THIS COMPANY IS NOT NOW AND NEVER HAS BEEN INTERESTED IN EITHER THE KERN LIGHT OR THE KERN INCANDESCENT GAS LIGHT COMPANY. The Kern Light, or, to designate it more properly, the Kern Bunsen Burner for use with an incandescent mantle, and the United States patents upon which it is based, were offered to this Company, which refused to purchase them upon the advice of its experts, Dr. Charles F. Chandler, of Columbia College, and Dr. Waldron Shapleigh, its Chief Chemist, and of its Patent Council, Mr. John R. Bennett, of New York City.**

This Company is not now and never has been interested in the Welsbach Incandescent Gas Light Company of England, nor is that Company interested in this Company. Your attention is called to the following correspondence, which defines **THE POSITION OF THE UNITED GAS IMPROVEMENT COMPANY**, whose name is mentioned in the advertisements which offer for subscription the stock of the Kern Incandescent Gas Light Company.

WELSBACH LIGHT COMPANY,
W. E. BARROWS, President.

WELSBACH LIGHT CO.,

BROAD AND ARCH STREETS,

PHILADELPHIA, PA., June 23d, 1899.

MR. THOMAS DOLAN, President the United Gas Improvement Company:

DEAR SIR: In yesterday's and to-day's New York and Philadelphia papers appear the advertisements of the International Banking and Trust Company soliciting subscriptions to the Capital Stock of the Kern Incandescent Gas Light Company. Among the names of the Directors of the said Trust Company published in the advertisements referred to appears the name of "George W. Elkins, United Gas Improvement Company, Philadelphia." As the United Gas Improvement Company has been prominently identified with the Welsbach Light ever since its introduction into the United States, the publication of its name in these advertisements, which also contain suggestions hostile to this Company, has greatly disquieted many of our shareholders. If you are willing to give me an authoritative statement of the position of the United Gas Improvement Company I shall be greatly obliged. Very truly yours,

W. E. BARROWS, President Welsbach Light Company.

THE UNITED GAS IMPROVEMENT COMPANY,
Broad and Arch Sts., Philadelphia, June 23d, 1899.

COL. W. E. BARROWS, President Welsbach Light Company:

Dear Sir: Answering your favor of even date, the United Gas Improvement Company is not now and never has been interested either in the Kern Incandescent Gas Light Company or in the International Banking and Trust Company. Mr. George W. Elkins is neither an Officer nor a Director of the United Gas Improvement Company, and does not represent the United Gas Improvement Company. Very truly yours,

THOMAS DOLAN, President,
United Gas Improvement Company.

The United Gas Improvement Company,

Broad and Arch Streets, Philadelphia.

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THE STANDARD DOUBLE SUPERHEATER,

LOWE WATER GAS APPARATUS.

Under Contract, 1899:

	SETS.	DAILY CAPACITY.
Fostoria, O.	1	250,000 Cubic Feet.
Derby, Conn.	1	750,000 "
Lowell, Mass.	1	1,000,000 "
Doylestown, Pa.	1	50,000 "
Darby, Pa.	1	400,000 "
Adrian, Mich.	1	125,000 "
Concord, N. H.	1	400,000 "
Sioux City, Iowa	1	750,000 "
Standard Gas Light Co., New York	3	5,400,000 "
Peekskill, N. Y.	1	250,000 "
Westchester, N. Y.	1	250,000 "
Jersey City, N. J.	1	1,000,000 "
Stapleton, N. Y.	1	750,000 "
London, O.	1	125,000 "
Chicago, Ills.	2	3,600,000 "
Putnam, Conn.	1	125,000 "
Mansfield, O.	1	250,000 "
Plymouth, Pa.	1	125,000 "
Athens, Pa.	1	125,000 "
Charlotte, N. C.	1	250,000 "
Consolidated Gas Co., New York	2	2,000,000 "
Quincy, Ills.	1	250,000 "
Boone, Ia.	1	125,000 "
Webster, Mass.	1	50,000 "
Flushing, N. Y.	1	250,000 "
Total	29	18,650,000 "
Previously built	294	187,100,000 "
Grand Total	323	205,750,000 "

Established 1858. Incorporated 1890.
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H. D. ABERNETHY, Sec.

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In Kegs less than 100 " " " 7 " "

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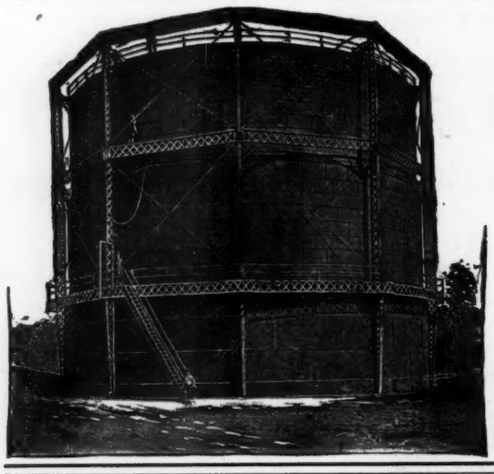

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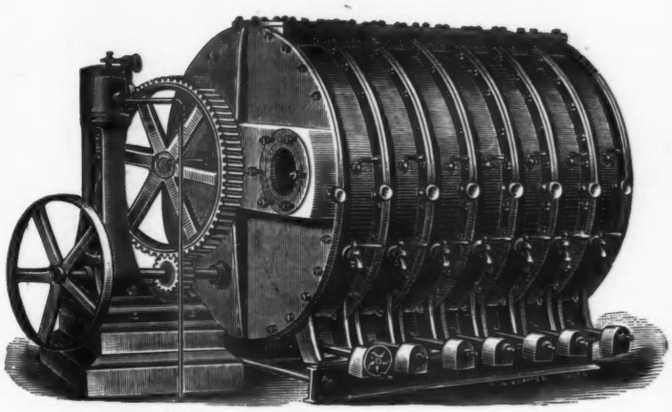

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—OF THE—

BOARD OF GAS COMMISSIONERS of the COMMONWEALTH OF MASSACHUSETTS.

MR. E. H. YORKE, NEW HAVEN, CONN., Dec. 1, 1898.

Dear Sir:—I am in receipt of a copy of "Excerpts from the Decisions of the Board of Gas Commissioners," which is a handy compilation in book form of extracts from the most recent decisions of the Gas Commission of Massachusetts.

I note that most of these extracts are broad and safe-guiding precepts, which apply with equal force to one Company as to another. The 13 years' existence of the Board of Gas Commissioners with its unusual opportunities for acquiring information, have justly made it a high and safe authority in all matters pertaining to the management, obligations, and rights of Gas Companies. Your little book will serve as a valuable reference library in settling legal complications which often arise between a Gas Company and its customers.

Yours truly, (Signed) F. C. SHERMAN, Superintendent.

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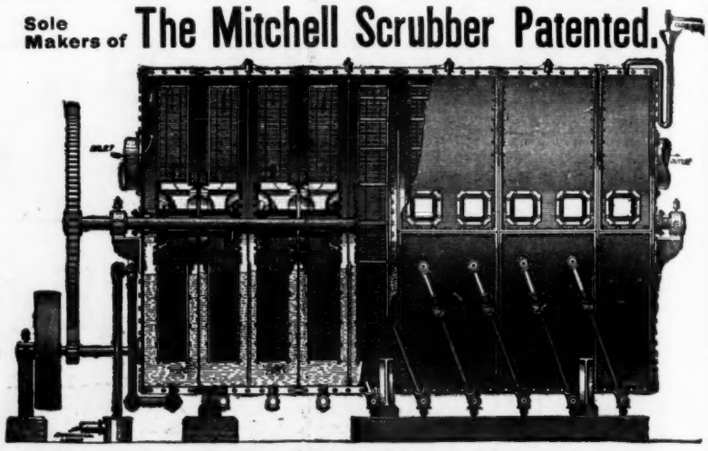

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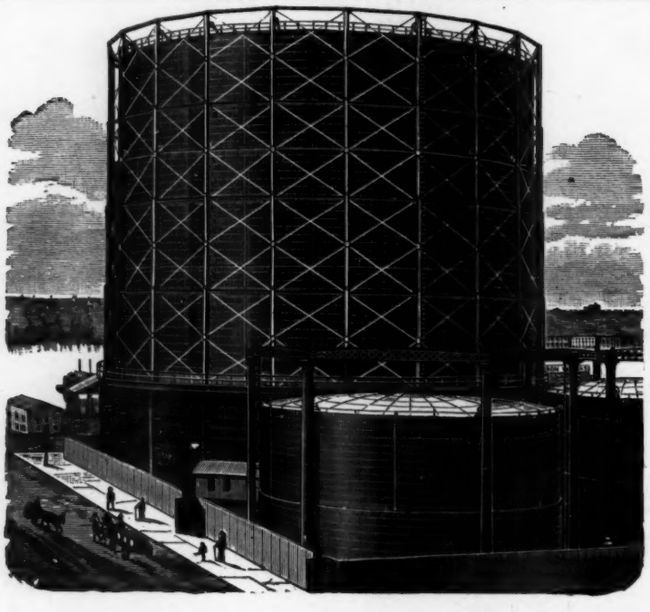

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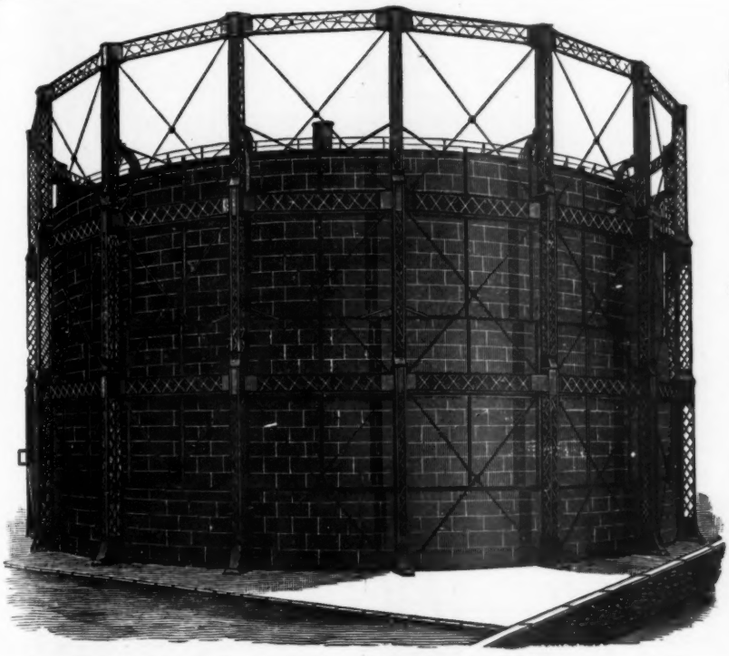

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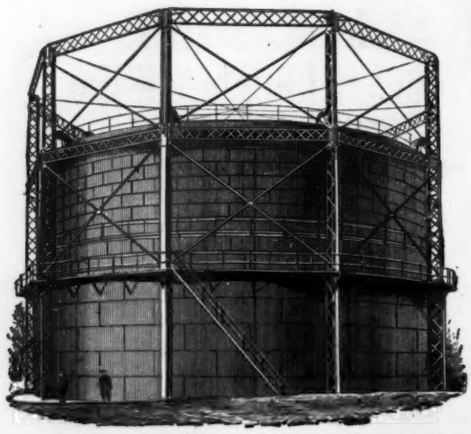

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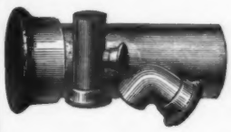

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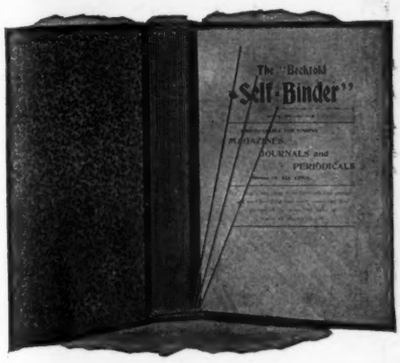

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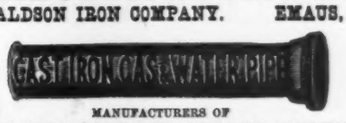

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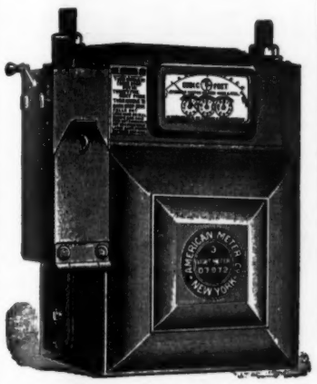

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